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# An Address
ON
# EMPYEMA*

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THE Programme Committee on this occasion very kindly assigned to me the subject of empyema. The committee has given me a large and important field in which to roam, and full liberty, I presume, to pause here and there to survey in some detail some of the major trails, the vantage points and even some of the bogs.

One who has built a part of his surgical foundation during years in general practice, naturally has a background of varied experience that determines the composition of the foreground of the picture he offers on such an occasion as this.

It follows then, that my remarks will be mainly, for the purpose of meeting the inquiries and problems of the general practitioner, on whom as a rule, rests primarily, the responsibility of recognizing and treating empyema very frequently away from the aid and comfort the laboratory can give, or even the assistance and council of a confrère.

The responsibility he is called upon to assume is great. The pitfalls in diagnosis and treatment are many and varied—taxing at times the resources of specialist and laboratory to successfully bridge or avoid them.

### *1. Empyema Following Pneumonia:*
### *Meta-pneumonic Empyema*

This is the type most frequently anticipated by the physician. Because of its frequency and the setting in which it appears, when the acute phase of the initiating disease has almost or wholly passed, he is, so to speak, in a state of mental preparedness to summon his diagnostic and therapeutic forces promptly and effectively. This is the type in which, least of all, is there excuse for failing to recognize its onset or presence.

The fact is still too frequently forced upon us, that the condition is overlooked, with consequences that are so obvious and impressive as to give cause for serious thought, conscience searching, and personal re-adjustment of clinical habits and methods. Omitting the possibility of loss of life as a result of failure in diagnosis, there still remains the aggregate of protracted sickness, impairment of function, deformity and disability (often permanent) that results in cases overlooked and treated late. This constitutes at least an implied individual challenge to our professional manhood and honour, which, (speaking in all charity), one does not wish to disguise.

The post-pneumonic empyema is, as a rule, massive and located at the base of the chest. The exceptions to this rule are those encysted forms of varying but smaller size that occur between diaphragm and lung, between the lobes, at the apex, or in multiple pockets.

Having failed to discover the presence of the common basal form in a suspected case, efforts should be directed to discovering one or other of the less common forms. This is admittedly

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more difficult, and requires a higher type of clinical technique and effort. The joy of accomplishment, however, is bound to come to the physician in these difficult cases, through perseverance and the application of the fundamentals of clinical observation and correct methods. Here one would like to point out and emphasize that the interlobar variety is more common than is generally supposed, and obviously, more readily missed than the massive form. In a case which has the setting and features suggesting empyema, and where there is failure to localize it, keep in mind the position of the great fissure of the lung, marking its direction on the chest wall, and concentrating on this area in your physical examination. I have in mind a specific case in which fourteen needle explorations at various points had failed to localize the pus. By concentrating on the surface line of the great fissure, a small area was mapped out giving the physical signs that warranted needle exploration at that point with full expectation of positive result. The needle and subsequent thoracotomy confirmed the clinical diagnosis of an inter-lobar empyema. The application of the fundamentals of anatomy and of exact clinical methods in this case converted a problem of apparent complexity into one of relative simplicity.

### 2. *Empyema During Acute Pneumonia*: *Syn-pneumonic Empyema*

It is even more serious to miss the diagnosis of empyema occurring during the active phase of pneumonia. Here the problem of diagnosis is more difficult than in the preceding type. The course for the physician is obvious: "vigilance is the price of safety." Systematic observations should be made from day to day or time to time, noting changes relating to the lung itself, and changes in the position of the heart and mediastinum. Personally, I teach the use of a pencil to mark on the skin the lines and areas of dullness or other features, so that future observations may be checked up against these markings; and finally there is the intelligent use of a suitable exploring needle of adequate bore, attached to a fully efficient syringe. It seems superfluous to speak of the latter, but the humiliating experiences so frequently noted through failure to properly carry out this simple operation, or to employ an efficient and suitable instrument is a sufficient reason for the above statement with emphasis.

### 3. *Empyema Associated With Infections*

We now come to the empyemata that occur as a result of infectious diseases: influenza, scarlet fever, measles, etc., or any acute systemic infection below the diaphragm. It is in this large group that the physician is especially liable to be caught off guard, and for that reason one wishes to particularly stress the importance, yea, the necessity of keeping empyema in mind as a possibility; remembering that infection reaches the pleura by the blood stream and lymphatics, in these cases, quite as readily as by contiguity of tissue in the case of pneumonia, lung abscess, or infections of the chest wall.

In this group are encountered the somewhat fulminating forms, due to organisms of a high grade of virulence, *e.g., streptococcus hæmolyticus*, etc., and the onset may be and frequently is, quite obscured by the primary disease, unless the chest be kept in mind and carefully watched. In this type the immediate danger to the patient is greater than in the cases due to the pneumococcus. There are mechanical dangers in both, (displacement of mediastinum and of heart, and pressure effects on the opposite lung and vessels endangering vital function), but here we have added the danger of a severe form of toxæmia. The deduction is obvious, but for emphasis it may be mentioned that prompt diagnosis and prompt treatment suited to the requirements of the individual case are imperative. Some of such cases will die as a result of the primary disease even though the empyema be promptly and rationally treated, but it is squarely up to us to give the chance to all, and thus save a large number that can be saved by controlling the empyema.

Let us briefly note in passing what occurs within the chest in all cases of empyema coming late for treatment. The lung becomes more and more compressed and ultimately lies by the side of the vertebral column as a mass resembling a rolled omelette. Fibrosis of the pleura and lung as well, becomes progressively more pronounced and firm, and when this is well established (as in cases untreated for weeks or months) the evacuation of the pus accomplishes but a small part of what is desired. These give us our crop of chronics—with a large cavity with suppurat-

ing walls and discharging sinus followed by permanent ill-health, disability, deformity—and all that surgeons are so familiar with. Such cases recognized and properly drained early would be cured, generally speaking, in a few weeks, and soon would have good restoration of lung function. Failure to get prompt healing in these cases is due to delay in establishing drainage (*e.g.*, by aspiration and thoractomy in sequence). In this connection the reply of the prominent London surgeon to Sir William Hale White is significant, "You seem unable to cure long standing empyemata," said Sir William. The surgeon replied: I never ought to be called upon to try." Here is a volume of truth crystallized.

*Treatment.*—Coming to the problem of treatment there are some fundamental principles to be kept in mind, and observed; these will be referred to later.

In the treatment of empyema, the old adage of "where there is pus it must be let out" must not be applied too literally. The question of how and when it is to be let out is highly important; the haphazard routine opening of the chest by incision is to be condemned. The free opening for drainage in some cases is correct and ideal, while in others it is a dangerous procedure, as fatal results show.

In the pneumococcus cases that are post-pneumonic, adhesions quickly form limiting the cavity and fixing the mediastinum. In all such cases where time has provided this protective mechanism, drainage by incision or rib resection is safe, and is the proper procedure. It is well, however, to relieve tension gradually by one or several aspirations before operation, and at operation to control the flow of pus, so that emptying is gradual and time is given for adjustment within the chest to take place *pari passu*. In such cases the diaphragm begins to rise to its normal level, the compressed portion of lung to expand and the mediastinum without fluttering is gradually and evenly moved to its normal place. The vital capacity of both lungs is increased; the pressure being relieved from both. The adhesions have prevented the collapse of lung on the affected side that otherwise would follow opening by incision. Thus we have an ideal setting and the particular kind of drainage (open or suction) employed is not the important factor in getting early healing, but the early establishment of free drainage is.

In the case of all acute empyemata, for example, in the streptococcic type associated with influenza or other acute infection, we have an entirely different setting. In the early days of its course no adhesions are present to fix the mediastinum nor to circumscribe the seropurulent collection, and, if the chest wall be opened by early incision, the pneumo-thorax produced is accompanied by lung collapse on the affected side, and a fluttering mediastinum.

*It must be borne in mind that the mediastinum is a mobile structure* and not fixed as is too generally thought; pressure on one lung deflects the mediastinum and transmits pressure to the opposite lung, which becomes compressed and thus it shares in the disability of the affected side, lowering "vital capacity" and function generally.

The production of lung collapse on the affected side by open operation seriously disturbs the intrathoracic mechanism and its functions. The splendid work of Haldane, Meakins and Priestley[1] gives meaning to this and a sound basis for intelligent and safe treatment. They have shown clearly that in such cases of lung collapse a diminishing amount of air enters the lungs, and in any case, and from any cause, when the supply is diminished to a certain degree, superficial breathing occurs, and later becomes periodic due to lowered oxygen tension. Anoxæmia is the result and this anoxæmia further induces superficial breathing. Thus a vicious circle is established, which if not controlled ends in death.

Thanks to the explorers of *science* we have the explanation of, and methods to avert the high mortality in cases in which adhesions have not formed to limit the effusion and fix the mediastinum.

The Empyema Commission appointed during the War to study the problem found that this type of empyema had a mortality of 30.2 per cent if early thoracotomy were done, whereas in the cases observed early, aspirated periodically for about three weeks until pus became thick and adhesions formed, and then the open operation was done and tube drainage established, the mortality was but 4.3 per cent. Thus a mortality drop of 26 per cent was obtained.

Another observation made elsewhere and in-

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dependently, showed a drop from 40 per cent mortality to 5 per cent by the above method. The deductions for our guidance in practice are obvious, and no further comment is necessary.

In case of bilateral empyema both sides should not be opened at the same sitting. Both may be aspirated, and when opportune one side may be opened and drained; the other some days subsequently. It is important to keep in mind that serious accidents have happened as a result of irrigating an empyema cavity. The work of Capps and Lewis[2] appears to show that there is a blood pressure lowering reflex from the inflamed pleura. This should be borne in mind when irrigation is proposed. It is claimed by some that the Carrell Dakin method as applied to some cases of empyema has advantages in shortening the period of convalescence. We have not found it so, but a cavity freely drained and fibrinous masses well removed at time of operation requires but simple methods of treatment, and ensures without such irrigation a prompt and satisfactory result, if we avoid meddling with the protective and reparative processes of nature.

### *The Anæsthetic*

The anæsthetic problem is an important one in these cases. With the passing of years the writer has drifted away from the use of general anæsthesia and it is his practice to perform the various operations (intercostal puncture, intercostal thoracotomy, or rib section thoracotomy) under local with entire satisfaction. It seems to me a positive necessity in all the graver cases. The patient is allowed the position of greatest comfort; some are done in the sitting posture. This advantage for the patient seems to contribute to their safety as well as comfort. The proper psychic state induced for the patient is quite as important as performing the operation without pain, and requires some experience, patience, and study of the individual temperament, it is true; but the end results give you ample reward, not so fully nor safely obtainable under narcosis.

The general anæsthetic carries a risk of its own directly, while the posture or postural changes imposed on the unconscious patient must have associated and unknown risks or dangers that should not be disregarded nor lightly estimated.

*The use of the local anæsthetic.*—Novacaine 1 per cent is entirely satisfactory and usually a small amount of "adrenalin chloride" is desirable: say to make a one in 10,000 dilution.

The amount of this solution required to produce local anæsthesia is small if properly used. A fine hypodermic needle should be used to introduce the fluid drop by drop within the skin, causing a pale wheal as the fluid passes from the needle along the line of the proposed incision. The deeper tissues under this line are then infiltrated, and as the operation proceeds further injection is done as required. Some prefer to block the intercostal nerves as a preliminary. This is not necessary if careful infiltration is done. If a section of rib is to be removed the injection is given around it when reached. All this can be done efficiently with amounts that positively are not toxic, if used carefully and systematically. The method is modified as needed for the particular type of operation done. Every move of the operation must be done with easy sliding movements so to speak, and without thrusts or sudden pulls to prevent the disturbing sensations, other than pain, that accompany such movement. For the obtaining and maintaining of a favourable psychic state for the patient, nothing should be staged as for an operation; the attitude of operator and assistants, their remarks, behaviour and the whole setting of the surroundings should suggest to the patient not an operation but the simplicity of a painless dressing, or the simple preliminary for an operative event, rather than the event itself; and finally the conversation with the patient to divert attention during the various moves completes in outline an efficient operative programme.

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# An Address
ON
# THE RELATIONS OF THE MEDICAL PROFESSION TO HOSPITALS

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THE standard that should guide us in discussing the relations of the medical profession with hospitals is the public welfare. That relationship which most effectively promotes efficiency in the prevention of disease and the care of the sick should, therefore, receive our approval, even though the application of this principle may work to the disadvantage of some members of the profession or of some hospitals. The medical profession being the group with the highest degree of scientific training for combating disease, should naturally control and direct the scientific features of the work of all the other forces in this field. A relationship which would cripple this function of the profession, infringe upon its right to manage its own affairs, or place the most highly trained group in a subordinate position, would impair the efficiency of all the forces, and, therefore would not conform to the standard mentioned. That the trend of events threatens to place the medical profession in a position of subserviency to hospital directorates is evident from the following considerations:

(a) Court decisions in Great Britain, Canada and, the United States of America, have established beyond question, the legal right of boards of directors of hospitals to exclude from, appoint to or dismiss from the attending staff any doctor without consultation or reference to any professional body. By "attending staff" is meant all doctors permitted to practise at the hospital whether on private or public ward cases. These decisions also place upon hospitals responsibility; firstly for the "due performance by their servants within the hospital of their purely ministerial and administrative duties; such for example, as the supply of proper food, apparatus, attendance by nurses in the wards, and the summoning of medical aid in case of emergency"; and, secondly, for "the exercise of due and reasonable care in the selection of the attending staff." Having met this second requirement the hospital is exempted from all liability for the character of the work done by members of the attending staff, its implied contract with the patient being limited to procuring for him a competent medical attendant. Two United States decisions denied even this degree of responsibility, holding to the view that the patients had made independent contracts with the doctors, who were, in these cases, held liable for damages. The liability of the hospital for the character of the medical treatment, as distinguished from nursing and hospital services, has rarely, if ever, been a cause of suit. On the other hand the liability of the doctor in attendance even upon charity cases, has been established by many verdicts. These legal rights of hospital governors were established by court decisions of fifty years ago at a time when the great body of the profession had no immediate interest in hospital management.

(b) The advance in science in the past twenty years has made group practice essential to efficiency, and has given to the hospital, the centre in which group practice is most conveniently carried out, a position of greatly increased importance. The medicine of less than fifty years ago was practised successfully without the aid of hospitals, which were then merely refuges for the homeless sick. They are now the agents through which the latest achievements of science are made available in the treatment of the sick by the profession. Dr. S. S. Goldwater says that "the key to nearly everything that makes for efficient medical practice to-day is in the hands of the

hospital."[2] The doctor who is deprived of this "key" is surely heavily handicapped and his efficiency as a doctor greatly impaired. The power in the hands of the hospital governors has to-day, therefore, a very different significance for the profession from what it had last century, when these legal precedents were established.

(c) The uncontrolled exercise of the power of appointing members of the attending staff by hospitals conflicts with the legal rights of the profession to control its licensing, educational and disciplinary functions. The license to practise, granted by the state on the certificate of the organized profession, may be partially nullified by the power to exclude from hospital facilities. The programme of standardization of the American College of Surgeons requires hospitals to judge the professional qualifications and ethical standing of doctors, and, to exclude those whom they deem deficient in these respects from the use of their facilities. The possession of such powers by hospital boards enables them to exert a far reaching influence, which no individual, attending staff or local professional organization can successfully resist. Even university faculties not infrequently must bend to the breaking point before this influence.

Hospital appointments, affording, as they do, opportunity for attaining the highest degree of professional competency, are the places of vantage, the most valuable prizes for which we practitioners compete. Inasmuch as these prizes result from the free work of members of the profession, and since this society has already agreed that this free service is essentially the privilege of the whole profession and should be controlled by it, it follows that the profession in effect creates these prizes, and then hands them over to lay boards of directors to distribute. From the date of registration as students of medicine a wholesome, stimulating competition occurs amongst us for such prizes. In the undergraduate course these prizes are supplied by the body which distributes them, and the awards are made for meritorious work by those qualified to judge and in whom the competitors have complete confidence. Both those who win and those who lose accept the verdict with equanimity because of this confidence in the fairness and competency of the judges. How different in the era of practice. Here the prizes are supplied by the competitors themselves and then handed over to bodies whose qualifications for the position of judges are most meagre. It is not surprising therefore, that the judgment is often faulty, and that the inequitable distribution of these prizes is a prolific source of dissatisfaction and disunion in the professional body. Meritorious work and ethical conduct are not the qualifications that weigh most in such a competition. Notwithstanding Stevenson's estimate of us as a body we are but human, and, under the stress of such strong temptation, methods ruinous to the *esprit de corps* of the profession, have been resorted to. Could the standards that prevail in the undergraduate field be transferred to the field of practice, it would do much to remove what is everywhere the most fruitful cause of dissatisfaction in our ranks, and, it would conduce to a readier observance of ethical standards by those not enjoying places of preferment in the profession. The more the influence of the profession, as a body, is excluded in the selection of candidates for hospital positions, the greater is the submergence of these undergraduate standards by ones demoralizing to both the hospital boards and the profession.

(d) It may be contended that in practice hospital directorates do not exercise these powers without the advice of committees composed of members of the profession, usually of the attending staff. This contention has force only in those cases in which the advisory committee has been chosen by the attending staff or by that section of the profession immediately interested. When such committees are chosen by the directorate they have no right to speak for the profession. Being the creatures of the power that chose them, they are subject to dismissal by that power at any time their actions do not meet with its approval. This was emphatically pointed out by the Reverend C. B. Moulinier, S.J., in an address to the staff of St. Boniface Hospital in August, 1925; and, it should be noted, that, as President of the Catholic Hospital Association, he spoke for considerably more than half the general hospital beds on this continent. It is clear, therefore, that committees appointed by the board of directors cannot represent professional

opinion. On the other hand committees elected by the attending staff are entitled to speak for the body that elected them. But are they free to do so? In the event of a conflict of opinion between the directorate and the staff, are they not likely to acquiesce in an injustice, for example, the sacrifice of civil rights, rather than offer any resistance to a body which, they know, has the power to blight their professional careers. They realize, also, that under present conditions there is no instrument in the hands of the organized profession by which it could bring to their aid the support of a united profession without which resistance is useless. Thus, it is, that the mere existence of such a power in the hands of hospital boards fosters an attitude of obsequious subserviency, stifles the free expression of opinion within our ranks and menaces our independence as a profession.

(e) In every field of activity the disposition of large corporations to ignore the rights of individuals is notorious. The statute books of several lands contain enactments designed to restrain this tendency. It may be thought that the fact that hospitals are incorporated, not for the purpose of gain, but to perform a public charity, renders them free from such a tendency. This view, however, is not supported by the record of their relations to the profession here and in other centres. Practitioners in almost every centre can recall eruptions of corporate force which indicate that the directors may harbour the feeling that a gainless occupation excuses the corporation from too nice a regard for the amenities of conduct in dealing with those who work for gain. Such incidents, however, are rare; and it would be ungracious, in this connection, not to give expression to the esteem the profession feels towards the many able and busy men who give their time and business training gratis, in serving upon the directorates of hospitals, and, especially, to the members of the religious orders, who for a bare sustenance, devote their lives to the labour of caring for the sick and unfortunate. But it should also be remembered, in this connection, that the total value of the free service rendered by the medical profession is computed to be greater than that of any other agency in the field; and, that this unequalled service in the cause of charity, aside from other grounds, justifies its claim to a fair share in the control of the work in this field.

(f) In the recent literature upon hospitals, written almost exclusively by doctors holding staff and executive positions, the dominant note is an exaltation of the responsibilities of hospitals. Dr. McEachern, associate director of the American College of Surgeons says: "Hospital authorities do not have a divided responsibility for the care of patients. They are responsible for both the hospital care and the medical treatment."[3] If this statement be a whole truth, it follows that the doctor who sends a private patient to an hospital continues in attendance only as an agent of the hospital, to which he is responsible; and, if we remember that "hospital authorities" legally means board of directors, the direction in which this doctrine leads becomes apparent. No doubt the author means by "hospital authorities" that section of the administrative body in control of the professional care of patients, usually a committee of the attending staff. But I have shown that under present conditions, such committees even when elected by the attending staffs, are not free to arrive at impartial decisions, and moreover, they have no authority to exercise disciplinary and licensing powers. The authority to license or to discipline has not been delegated to hospital directorates or hospital staffs by the bodies in which it legally rests, *i.e.*, the colleges of physicians and surgeons in the provinces of Canada and the state councils in the United States. Consequently when the members of these committees exercise such powers, they do so as usurpers, or as the agents of a usurping power.

A second statement made by Dr. McEachern that "the patient entrusts himself confidently to the hospital"[4] may be in the direction of progress, but there is another view, less vocal, but still widespread, namely, that the patient entrusts himself confidently, not to the hospital, but to the doctor, and that he expects the doctor will choose the hospital in which to carry out treatment and will see that proper hospital care is rendered. Is this an old fashioned view soon to disappear, and is the above doctrine of hospital responsibility to take its place? if so it means the loss of those confidential relations between patient and doctor which a corporation can not replace.

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It is clear that this exposition of present conditions leads to the conclusion that hospital authorities have, by the force of circumstances, been placed in a position through which they can and do assume responsibilities and exercise powers that legally belong to the medical profession. They have acquired this position, not by intentional aggression, but rather in response to pressure by that section of the profession most influential in hospital affairs, in order that responsibilities and duties may be discharged, which were being neglected because of failure on the part of the profession to devise means of meeting them. The fact that hospital corporations took on this work in most cases reluctantly, does not lessen the danger menacing professional rights. A corporate body like an hospital cannot take on new duties without at the same time assuming new powers, nor can the profession neglect responsibilities without at the same time sacrificing rights or privileges. Like most individual doctors, the organized profession has neglected the business side of its relations. We are a united body for only one purpose, the advancement of medical science. In all other matters we are individualists without cohesion or group consciousness, hence our business relations as a group have been given little consideration. The changes in conditions and method of practice that have come with accelerating rapidity during the past twenty-five years have revolutionized our relations with hospitals and placed upon us new obligations, such as: (1) the determination of the qualifications necessary for the practice of major surgery and of the various specialties; (2) the extension of our code of ethics to cover the new relations with hospitals and other organizations in the field of health interests, and (3) the development of the administrative machinery necessary to meet these responsibilities of the profession.

The work of the American College of Surgeons, in labelling with a degree those it judges qualified in the surgical specialties, has taken an important step towards meeting these responsibilities; and, by its statements of the requirements for the minimum standard for hospitals, it has done much to correct abuses in surgical practice, and defects in hospital equipment and administration. Owing largely to the fact that its executive was beyond the reach of the influence that so often paralyzed the efforts of local professional bodies, it was able to effect within a few years reforms for which attending staffs in many centres pleaded in vain during the previous decade. The success of its programme demonstrated the feasibility of a plan by which the profession may exercise a supervising control, in matters belonging to its sphere, over the work of hospitals; and the great improvement effected in hospital efficiency, especially in hospitals that had previously ignored the recommendations coming from attending staffs, shows that such control is needed in the public interest.

Let me however point out what appears to be a weakness in the plan of the College, arising out of ambiguity in the phraseology of clause 3 of the minimum standard. This clause requires: "that the staff initiate and, with the approval of the governing board of the hospital, adopt rules, regulations and policies governing the professional work of the hospital." The staff is required to initiate, to take the first move in the formulation of rules, etc. It will naturally do this through a committee, and this committee must be chosen by the staff, because a committee chosen by the board of directors or any power outside of the staff cannot initiate nor adopt anything in the name of the staff. The obvious meaning of this clause is that the staff shall choose its own executive committee. If this be accepted as the correct interpretation, it follows that hospitals whose directorates deny to the staff the right to choose its own committees, are not conforming to the requirements of the minimum standard. On the other hand, if this interpretation be wrong, and the claim that all authority is derived from the board of directors be admitted, it follows that the college has abandoned, in a large measure, the legal right of the profession to licensing, disciplinary and educational powers. It is inconceivable that the latter horn of the dilemma was the one accepted by the American College of Surgeons, or that it will be acquiesced in by the general profession.

The acceptance by the College of the interpretation which recognizes the right of attending staffs to choose their own executive committees, would, in some measure, lessen the domination of the profession by boards of

directors still clinging to the doctrine of absolutism. But this alone is not sufficient. These committees, inasmuch as they have in the past, do now, and will continue to exercise licensing, disciplinary and educational functions, should have the authority to do so from those bodies which legally control these functions, the provincial and state councils and the faculty of medicine of the university of the province or state. The requirements of the fifth interne year of the medical course afford grounds for the faculty of medicine of this university extending its influence to all hospitals in which its students take interne positions; and, in hospitals used for undergraduate clinical teaching, the influence of the university faculty should dominate. The control of hospital committees by the provincial or state councils and the university faculty might be secured by giving to these bodies the right to appoint one or more members of the committee. Such committees should be responsible to these two bodies for all decisions which directly involve the exercise of the powers belonging to them, and a plan should be devised by which an appeal from their decisions, to a joint committee of these bodies, could be taken. In all other matters the committees should act merely in an advisory capacity to the representative of the board of governors.

Dr. Henry A. Christian, Professor of Medicine, Harvard University, in discussing this problem, advocated a plan by which "those representing the administration and those representing the professional care of patients" will have "equal authority in all decisions"[5] concerning hospital administration. This is claiming a wider power for the profession than I have proposed here. My plan is designed to make such committees feel, in exercising the functions mentioned, accountability not to directors of hospitals but to the profession, and to protect them from the disfavour and penalty, which a decision disagreeable to a board of governors, might bring upon them. They are exercising judicial powers on behalf of the profession. It is the duty of the profession, as far as possible, to afford them this protection. Without it they are not free agents.

We have a code of ethics formulated and adopted by the Canadian Medical and the Provincial Medical Associations governing our relations with one another and with patients. These associations are therefore in some degree our legislative bodies. The officers of the provincial councils interpret, and enforce, when the need arises, these regulations. They are the judical and executive bodies of the profession. Hospital committees have for decades exercised similar powers without the guidance of regulations framed by the legislature and without the authority of the executive bodies. This was of no importance when only 10 per cent of the profession made use of hospitals, but, now since approximately 80 per cent use them and the scientific practice of medicine is impossible without them, it has become the most important problem before us. The need of rules to guide these committees in their exercise of this most far reaching power is self evident. Such rules should be prepared by the legislative bodies and be included as part of our code of ethics.

It would be an error to infer from this discussion that a state of perpetual contention exists between attending staffs and boards of hospital directors. On the contrary the usual state is one of peace, but it has been a peace based upon the subordination of the staff. Such relationship cannot promote the co-operation so essential to efficient hospital administration. The first survey in 1918 by the American College of Surgeons found only 12.9 per cent of 692 hospitals of one hundred beds or over up to a minimum standard. Such was the result of the policy of absolutism applied for decades by boards of directors. Before satisfactory relations can be put in practice a theory based upon equitable principles must replace that based on the doctrine of the absolute authority of boards of directors.

*Summary*

1. The legal powers of hospitals as at present exercised conflict with the legal rights of the profession in the exercise of its educational, disciplinary and licensing functions.

2. This conflict of authority is of long standing but only in recent years, owing to changes in methods of practice, has it become a disturbing factor in their relations.

3. The executive machinery in the hands of the profession is inadequate to meet the new

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duties resulting from advances in scientific medicine, and the profession has neglected to devise new machinery for this purpose.

4. Hospitals have been encouraged by an influential section of the profession, to assume the duties which the organized profession neglected.

5. The remedy proposed consists in:

(a) A plan to ensure that hospital committees be representative of the hospital staff, the university faculty and the provincial licensing body; that they have authority to speak for these bodies in dealing with matters directly affecting their prerogatives and that they be afforded the support, as far as possible, of the general profession, in their decisions regarding such matters.

(b) The preparation of additional clauses to the code of ethics to govern our relations with hospitals and other agencies in the health field.

Let me say in closing, that the presentation or the support of these views on the question before us, by one holding or seeking to obtain a place of preferment, might, and probably would, ruin his chances. We are all, more or less, intimidated by this power, and consequently, although these views are widely held, and the need for their expression has long been evident, they are uttered only in whispers. This society is the forum of the local profession in which every man should feel free to express his opinion, but unfortunately he is not free to do so without exposing himself to penalties. It is appropriate therefore, that one of the senior rather than a junior member of the profession should accept whatever onus and unpleasantness the formal presentation of these views may entail.

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**Merbaphen (Novasurol) as Diuretic in Congestive Heart Failure.**—A comparison of the diuretic effectiveness of merbaphen with that of the drugs previously available, has been made by H. M. Marvin, New Haven, Conn., using patients who responded to both types of treatment as well as those who failed to react to the usual therapy. Theophylline and theobromine were used as the control diuretics. The patients selected for study were those with advanced congestive heart failure characterized by large amounts of edema; no selection was made on the basis of age, sex or etiologic type of heart disease. Those with evidence of renal disease were excluded. Merbaphen has been administered in doses of 1 or 2 c.c. by intramuscular or intravenous injection to twenty-six patients with advanced congestive heart failure. Seventeen of these received adequate doses of digitalis and theophylline or theobromine; fifteen had repeated doses of both merbaphen and theophylline over a long period. Merbaphen and theophylline each failed to cause diuresis in seven instances. Of the seven who failed to respond to theophylline, four subsequently responded very well to merbaphen. Of the seven merbaphen failures, two subsequently had excellent diuresis from theophylline. Only three patients failed to respond to both. Theophylline caused intense diuresis in a total of five patients, merbaphen in four. Eight of the nine excellent results were obtained in patients with arteriosclerotic heart disease. Ammonium chloride was used in conjunction with merbaphen in four patients. In three, the combination was more effective than merbaphen alone; in the fourth, a comparison was not made. Merbaphen alone was given to nine patients before they had received digitalis. There was moderate diuresis in seven, excellent in one, and no change whatever in one. Eight of the nine subsequently obtained excellent diuresis from digitalis alone or in combination with theophylline. In every instance, the response to the usual treatment was better than that to merbaphen. Toxic effects of merbaphen were observed in eight patients of the twenty-six: stomatitis and salivation in four, bloody diarrhea in two, sterile abscesses in two (after intramuscular injection), and collapse in one. Only one patient exhibited more than one of the foregoing effects. While merbaphen occasionally proves a powerful diuretic, Marvin says, it should probably be employed only in those patients who have failed to obtain relief from theophylline or theobromine.—*J. Am. M. Ass.*, Sept. 23, 1926.

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China, the land of famines, could double her food supply by opening up virgin soil and introducing scientific farming. Packing plants comparable to those of Chicago located somewhere north of Peking are foreseen by Dr. Shih Tsin Tung, economist, who has recently made a report of the resources of his country to the *Scientific Monthly.—Science Supplement*, Dec. 3, 1926.

# An Address
ON
# THE PRESENT POSITION OF THE CANCER PROBLEM*

By James Miller, M.D., F.R.C.P. (Ed.)

*Professor of Pathology, Queen's University, Kingston*

## Part II

### Organismal Origin of Cancer†

SINCE the discovery of the Russell fuchsin body, supposed to be a yeast, many parasites have been suggested as causally related to tumour growth. In some cases the supposed organism has been demonstrated microscopically, in other instances cultures have been obtained. Of the cell inclusion type all (Ludford[1]) have been relegated to one of two categories (1) Plimmer's bodies, believed at first to be sporozoa now proved to be either of the nature of abortive secretions, or nuclear extrusions. (2) Inclusions of other cells, red corpuscles, leucocytes, etc., within the cancer cell. The Russell bodies usually occur between the cells and are a form of hyaline degeneration. Of bacteria *cultivated from growths we have the Micrococcus Neoformans* of Doyen and many others, among the more recent being a pleomorphic organism described by James Young of Edinburgh. Of larger parasites we have the *Demodex Folliculorum,* an acarus described by Borrel and a spiroptera, a nematode associated by Fibiger definitely with a form of gastric cancer in rats. In the case of the last parasite the connection is not believed to be a causal one. The worm acts as an irritant similar to the chemical irritant in tar, an important point, however, being the relatively short period (often less than three months) required for the production of the malignant tumour.

It will be found that most of those who have supported the parasitic origin of cancer have been clinicians or biologists. Pathologists have always adopted a conservative attitude as regards the various cancer organisms and have in consequence often been accused of prejudice in the matter. But the pathologist has good reason for his scepticism. He is impressed by several facts as to the pathology of malignant disease as opposed to diseases of known infective origin. The first of these facts is that when a germ is causally related to a disease no matter what organ or tissue or animal it is introduced into, it produces the same type of cell reaction in all. Take for example tuberculosis. If we introduce tuberculous material or a pure culture of the tubercle bacillus into liver or breast or muscle or skin it produces the same type of reaction, namely an aggregation of fibrous tissue cells, endothelium and round cells or lymphocytes with the resultant production of the tubercle nodule or follicle. Now if there exist a cancer germ, an organism common to all the types of cancer growth in all the various organs and tissues, we must suppose that it has the power of inducing a different type of cell reaction according to the tissue or organ in which it finds itself. Thus, if it starts as a tumour in the liver, that tumour is composed of liver-like cells; if in the breast, it gives rise to gland cells resembling those of the breast glands or ducts, and so on. That is a very strong argument against all forms of cancer being due to one and the same germ. Another argument is the fact, to which we have already drawn attention, that tumours in animals are inoculable only within very narrow limits. The inoculability of the cancer cell is always confined to a particular species and often to a particular breed. Now although there are limitations to the pathogenicity of germs the limits are never so circumscribed as this. Taking tubercle again as the example: tuberculosis occurs in man, bovines and birds as

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† Part I. "An address on the present position of the cancer problem," *Canad. M. Ass. J.*, Jan. 1927, xvii, 16.

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well as in other species. It is true that man is not as readily affected by bovine tubercle bacilli as by the human type of the organism, but undoubted instances of bovine infection occur. One or two examples even of avian tuberculosis have been described in man although the instances are rare in the extreme. Vice versa, human tubercle bacilli are pathogenic for a large number of animals. But in no instance has a human cancer been successfully inoculated into a lower animal, although the experiment has been frequently attempted. The inoculability of cancer is strictly limited to the species in which the growth arises. A third argument against the organismal origin of cancer is that until the Rous sarcoma of the fowl was discovered, the cancer cell itself had to be introduced before a tumour could be grafted on another animal. In other words, it appeared as if the cell were the real parasite.

If cancer is ultimately proved to be an organismal disease some explanation must be found for these anomalies. Up till recently no such explanation was forthcoming.

### Gye's Theory of the Origin of Cancer

Before discussing Gye's work it is necessary to lead up to it by stating certain facts regarding the Rous fowl sarcoma already mentioned. This tumour was first described by Rous[2] in 1910 and the remarkable fact about it was that it could be transmitted from fowl to fowl not only by small pieces of tumour tissue and therefore by tumour cells, but by tumour juice or by a saline extract which has been passed through a fine porcelain filter, fine enough to retain very minute organisms. It took a longer time for the tumour to appear when the cell-free filtrate was used; also, the tumour grew more slowly, but the result was the same, a malignant cellular growth, which ended in killing the animal. Further work by Rous showed that the growth produced in this way was derived from the animal's own tissues. It thus resembled the spontaneous tumour of the mouse not the tumour developing from the inoculated graft. The original fowl sarcoma which has been studied so thoroughly was a spindle cell tumour. Several other varieties of growth, all sarcomata, have since been discovered differing somewhat from the original one in structure, but all transmissible by means of filtered extract. The question that at once suggested itself to Rous and his collaborators, was "Have we here a growth produced by an organism, a filterable virus, or is this a condition apart and by itself of which we have no example in other animals or in man?" It was this problem, unanswered by the original workers, which Dr. W. E. Gye,[3] pathologist to the Medical Research Council in London, took up and attempted to solve.

In the first place Gye found that he could "cultivate" the tumour-producing factor from the Rous sarcoma juice. He did this in a special medium of serum broth to which was added a fragment of embryonic tissue. The "cultures" were incubated under anærobic conditions and could produce tumours in fowls on inoculation. He then found that if the "culture" was centrifugalized the upper layer of the medium lost its power to produce a tumour while the lower layers retained it. If he decanted the supernatant fluid from the "deposit" and then washed that "deposit" in saline it lost the property of producing a tumour, but if some of the original supernant fluid were mixed with it (fluid which by itself could produce no tumour) it recovered the property of inducing a growth. Gye interpreted these results in this way. Two bodies are concerned in the production of the Rous tumour: (1) a living germ or virus, a filter passer which falls to the bottom of the "culture" when that is centrifugalized, and (2) a chemical substance which he named the "specific factor" which is found in the supernatant fluid as well as in the unwashed deposit. When the virus was washed free of all specific factor it lost the property of producing a tumour. Likewise if only the supernatant fluid was injected into a fowl no tumour grew. If, however, the two were combined and injected together, a tumour resulted. A separation of these two elements could be effected in other ways than by centrifugalizing. The specific factor could be destroyed by heating to 55° C. for fifteen minutes and the virus or germ could be killed by the use of antiseptics, such as chloroform, acriflavin and hydrocyanic acid. Thus a filtrate from the tumour heated to 55° C. for fifteen minutes when injected into the breast of a fowl produced no tumours whatever, the specific factor having been destroyed by heat, but when mixed with tumour extract treated with acriflavin (likewise by itself innocuous) a combination was formed which produced a tu-

mour. So far as regards the Rous sarcoma; but what about other tumours in animals and cancer in man? Gye found that he could substitute "cultures" prepared in the same way from mouse and rat tumours and even in one instance from a breast cancer in the human subject for the virus part of the combination. Thus a "culture" from the human tumour, presumably containing cancer germ, mixed with a Rous tumour extract treated with acriflavin (specific factor only still present) when injected produced a sarcoma in the breast of a fowl, whereas the two elements separately produced nothing. Gye was, however, unable to find a specific factor in any other tumour, human or animal to substitute for the specific factor in the fowl tumour. In consequence he has been able to produce experimentally only the fowl sarcoma even when employing the virus from a carcinoma for the specific factor determines the character of the tumour. It should be stated that it is not necessary to "cultivate" the virus from a malignant growth. The same result is obtained according to Gye's latest pronouncement, by filtered extract of the growth.

Before discussing Gye's theory his work should be linked with that of Mr. J. E. Barnard. For some time Mr. Barnard, who is a remarkably skilled microscopist and photographer, has been studying the filterable viruses known to be infective in man and animals. He has been attempting to see and to photograph the germ undoubtedly present in cultures from lesions in such conditions as pleuro-pneumonia in cattle, and by means of a special ultra-microscopic technique he has succeeded in demonstrating a spheroidal body which he regards as the germ. Now the important point is that Mr. Barnard has shown that the same type of body as is present in pleuro-pneumonia cultures is present also in cultures from certain malignant growths including the Rous sarcoma and a human carcinoma. The cancer cultures do not develop so rapidly as the pleuro-pneumonia ones, and the minute spheroidal germs are even smaller when seen in the photograph, but there is no essential difference between the two.

Now as to the theory founded upon this work. Gye supposes that there is a cancer germ or virus responsible for all forms of cancer in man and animals. This cancer germ is one of the filterable viruses and grows only in special media under anærobic conditions. It enters its victim from the outside through some lesion or other. It cannot, however, of itself do any harm. In order to produce a malignant growth some one or other of the cells of the body must be penetrated, and to do this the cell's natural resistance must be overcome. This is effected by the specific factor, probably a chemical substance derived from the tissues themselves and varying in composition according to the type of tissue concerned. Thus there is an indefinite number of these specific factors. Into the cell which has had its resistance broken by its own specific factor the cancer germ then enters, and induces in it the uncontrolled, aimless and irresistable proliferation which is characteristic of the malignant tumour. This theory goes far to remove the objections already mentioned to a universal cancer germ. The variation in type according to the organ or tissue is explained by the specific factor notion. The strict limitation of inoculability to a certain species is also explained. Some of Gye's supporters wish to widen his interpretation of the term specific factor. Thus Cramer[4] uses instead of Gye's term specific factor, the expression "accessory biological factor" interpreting it as " a special functional condition of the cell, or the absence or oxygen or an abnormal cell metabolite." I cannot find that Gye himself favours such a wide interpretation. The condition in which this accessory biological factor is produced may, according to Cramer, be induced by the various forms of chronic irritation such as tar, x-rays, and animal parasites. Gye's main difficulty so far is that he has been able to obtain the specific factor only from the Rous sarcoma, although he has grown the virus from a large number of tumours both sarcomas and carcinomas, animal and human. Hence he has succeeded in producing only sarcomas, because a virus from a carcinoma when mixed with the specific factor from the Rous tumour will, as stated, only produce a sarcoma on inoculation. Apparently the specific factor is produced in reasonable amount only in this fowl sarcoma. In other tumours it is developed in such minute quantities that it cannot be isolated and made use of for purposes of experiment. This

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is, of course, the chief weakness of Gye's theory. If he could reverse the process and with a culture of virus obtained from a sarcoma mixed with a specific factor from a carcinoma produce a carcinoma, objections to the theory would largely disappear. The strong point about Gye's work is, however, that it does attempt to explain a situation hitherto inexplicable. His work has been attacked and the attack has been damaging. In April, 1926, nine months after the publication of Gye's first paper, J. B. Murphy[5] of the Rockefeller Institute, a colleague of Peyton Rous in some of his researches on the fowl sarcoma, published the results of some experiments carried out on the lines of Gye's work. The gist of Murphy's criticism is that he found that he could substitute for the "cultures" from malignant growth, "cultures" from mouse placenta, rat placenta and chicken embroyo, *i.e.*, from tissues which are not tumours at all. These mixed with chloroform-treated filtrate from the Rous sarcoma (specific factor) gave tumour growths on inoculation, just as did the so-called "cultures" of the cancer virus. According to Murphy there is therefore no necessity to suppose the existence of a living organism at all. Something is present in cultures from malignant tumours which reactivates extracts of Rous sarcoma inactivated by treatment with chloroform, but this substance is also present in certain normal tissues. Murphy inclines to the view that the chloroform has not killed, but has merely attenuated the causative agent of the fowl sarcoma. To this criticism Gye has replied (*loc. cit*). He states categorically that he has completely failed to find a substitute in extracts of normal tissue (he does not say cultures) such as chicken embroyo, etc., for extracts of malignant growths. It is interesting that he reports in this latest paper his failure to find the agent which reactivates antiseptic-treated extracts of Rous sarcoma in a sarcoma from a mouse. That is to say, there is at least one malignant growth in which no virus factor has been found. This he states is one of the most puzzling facts he has yet met with, and he has no explanation which accounts for it. We must leave the matter at this point. The situation is for the moment obscure. It will no doubt be cleared up by further research.

### Blair Bell's Theory of Cancer

Adami[7] tells us that the fact which first many years ago directed Blair Bell's attention to the connection between lead and cancer, was the relationship between lead and abortion. He conducted a series of experiments upon pregnant animals administering to them lead salts. He found that lead was a powerful abortifacient apparently through a specific action upon the syncytium of the chorionic villi by means of which the trophoblast penetrates within the maternal blood sinuses. Recalling the similarity in function between the chorionic ephithelium and malignant growths, both of which are invasive and infiltrative, and the occasional similarity in the appearance of the cells, giant cells not unlike those of syncytium being found now and then in malignant tumours, Blair Bell has been led to promulgate the following theory to explain cancer. Under the influence of certain factors of which heat, trauma, radiation, infection and toxæmia are the common examples, a somatic cell, in order that it may live under these disadvantageous conditions, undergoes a "reversionary development" or process of "dedifferentiation" from a condition of high specialization back towards the most distant ancestral type—the chorionic epithelium." In support of this theory Dr. Bell points to certain chemical similarities between cancerous tissue and the cell elements of the chorion. Now, slight modifications of this idea that cancer resembles an early stage of the developing embryo are by no means new. The notion that the malignant cell owed its extraordinary exuberance to a process analogous to fertilization has been toyed with by pathologists for years past. The theory is known as the gametic theory of cancer (Ludford *loc. cit*) and it received support for a time by the observation that the nuclei of cancer cells sometimes divided in a fashion similar to germ cells at a certain stage, *i.e.*, by heterotypical mitosis (Farmer, Moore and Walker[6]). Of course all notions of the nature of malignancy must remain mere theories until the cause of cancer is found and until this discovery is made; theories, not obviously at variance with facts, may be provisionally accepted. The comment one would make on this one is that somatic cells are *not* the descendants of the chorionic epithelium. The cells of the trophoblast and the

somatic cells are both descended from a common ancestor, the zygote or fertilized ovum. They are, if one may use the term, cousins but the one is not ancestral to the other. Dr. Bell talks also of dedifferentiation of the somatic cell. But is not the syncytium and Langhans cell of the trophoblast differentiated in structure and in function to a certain degree, although not perhaps to the same degree as the somatic cell? However we are not concerned so much with Dr. Bell's theory of cancer as with the treatment of malignancy deduced therefrom.

### The Lead Treatment of Malignant Disease

It is not the purpose of this paper to discuss at all fully the results which have been obtained by the treatment of cancer with lead. Excellent summaries as well as more detailed accounts are to be found in current medical literature. Of summaries we have those of the late Principal Adami.[7, 8] The most recent detailed accounts are to be found in the *British Medical Journal*, November 20, 1926.[9 to 13] A perusal of these papers leaves the impression in one's mind that the results obtained by the Liverpool Cancer Research Organization are arresting when the following facts are taken into consideration, *viz.*, the fact that we are dealing with a wasting disease the complications of which are liable to carry off the patient at any time; the fact that patients are apt to tire of a treatment which does not produce magical results rapidly, especially if the treatment is painful and disagreeable; and the fact that lead is a toxic substance liable itself to kill. The mortality in inoperable cancer is 100 per cent. Out of a total of 227 cases treated, the Liverpool Organization claims cure in ten cases and probable cure in other thirty-one. These are striking results. That lead has a toxic action upon cancerous tissue is borne out by the effects which Dr. Carter Wood[9] of the Institute of Cancer Research, Columbia University, has found to follow the administration of colloidal lead to rats with tumour grafts. This author summarizes his results as follows: "So far it may safely be concluded that colloidal lead in sublethal doses produces profound changes in animal tumours which in a small percentage may lead to a permanent cure." The effect of colloidal lead upon human tumours has been studied by Dr. Glynn,[10] Professor of Pathology, University of Liverpool, and the same result has been noted. "In a majority of lead-treated malignant growths so far examined no histological evidence of its action could be detected. But in one or two instances there was histological evidence that the lead had increased the regressive changes, which usually occur in malignant neoplasms, and in one case of cancer of the breast remarkable regression of the epithelial cells occurred in metastases in liver, lung and suprarenal." This appears to be the net result of the action of lead upon growths. Just as there is a striking idiosyncrasy exhibited to its action by some individuals, so there are certain malignant tumours which are more profoundly affected by the drug than others. Fault has been found with the Liverpool Cancer Organization for not having made available for the profession at large the particular preparation of lead which it employs. This matter is dealt with by Dr. Blair Bell.[11] The preparation used by the Liverpool Cancer Organization is prepared by Professor Lewis[12] in the University. It is a colloidal form of lead known as "chorio-trope." In treating cases it is injected directly into the circulation through the arm vein. It must be employed fresh and slight variation in its preparation may make it useless. Stress is laid upon the necessity of selecting cases and examining the kidney function before treatment, as fatal results have followed the use of the drug in case of renal inadequacy. For these reasons the preparation has not been made available to the profession at large. No doubt further investigation will reveal a lead preparation which can be used by all and sundry, meantime there is nothing to prevent medical men treating surface cancers by means of ionization of lead salts. We have been trying out this method in a few selected cases in the Kingston General Hospital. The technique as worked out by one of our chemists, Professor Cadenhead, is as follows: The apparatus and equipment required is, (1) a solution of lead nitrate; (2) a solution of sodium chloride; (3) a 22½ volt radio "B" battery; (4) two small (¼ inch) carbon rods about six inches long; (5) absorbent cotton, elastic bands and covered copper wire; (6) milliameter. The method of carrying out a treatment is as follows: pads of cotton wool about an inch in diameter fixed with elastic bands to the ends of the carbon

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rods are connected in series with the ammeter and battery. The negative pad is now saturated with salt solution and applied to a convenient spot on the body, the leg or the arm, and fixed in position by bandages under which is placed oiled silk to prevent the electrode drying. This makes the body the cathode and it will attract the positively charged lead ions at whatever point they may be applied. This will of course be the skin over the growth. The skin must first be sponged with ether before the pad is applied. The positive terminal or anode is now saturated with the lead salt and applied under oiled silk to the tumour. It is best to close the circuit after the electrodes have been adjusted to the patient, and a device for gradually raising the voltage is desirable. The maximum initial voltage should not exceed 7½. This may be gradually increased. A careful watch should be kept on the milliameter, and if the current rises too high, or if the patient experiences undue discomfort, the voltage should be lowered. For a commencement one milliampere should be used. This may be increased to from 10 to 15 milliamps. In no case should the current be allowed to exceed this. The amount of lead liberated can be calculated by means of Faraday's law, and it is of importance that this be noted at each treatment. Appended is a table for making the calculation.

| *Milliamps* | *Flowing for – minutes* | *Liberate Lead* |
|---|---|---|
| 1 | 15 | 0.0009 grm. |
| 1 | 30 | 0.0018 |
| 3 | 15 | 0.0027 |
| 5 | 1 | 0.000333 |
| 5 | 5 | 0.00166 |
| 5 | 10 | 0.00333 |
| 5 | 15 | 0.0047 |
| 5 | 30 | 0.0094 |
| 5 | 60 | 0.0188 |

This last value is equivalent to 18.8 milligms of lead, which is approximately Blair Bell's minimum dose.

Slight superficial burns tend to follow the treatment. These are probably due to nitric acid set free at the electrode. They rapidly heal, leaving no trace, and they probably increase the permeability of the skin. There is nothing new about the above method of treatment. The Liverpool Cancer Research Organization has apparently used the method of ionization for the introduction of lead into superficial neoplasms for some time past (Cunningham[13]), although details of administration and results are not given. The method has received support by the experimental work of Borrel Coulon and Boez[14] who have shown that amongst the number of metals tested, lead is the most active in destroying tumour tissue. Dealing with sarcoma grafts in rats which had already attained a considerable size, the observers found that in eight cases out of ten treated by ionization with lead nitrate, the tumour entirely disappeared and did not return on cessation of treatment.

Owing to its discursive nature it is impossible to summarize the main conclusions of this paper. One can say this, however, about the present position of the cancer problem that, while we are still in the dark as regards the real nature of the disease, several hopeful lines of research are opening up. Probably never in the history of the study of the problem has the situation been so favourable. That perhaps is not saying a great deal. It may be that much spade work has yet to be done in the domain of the chemistry of the living cell before spectacular results can be hoped for, but there is always the chance of some brilliant discovery shedding a flood of light upon the problem and thus ridding mankind of what is probably the last and worst of the pestilences that walk in darkness.


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Polluted city water has enabled a typhoid patient to obtain damages from the city of Albany for permanent injury to his health. A $3,000 verdict was awarded on the ground that the city contracts with each citizen to furnish unpolluted water and had failed to warn the people that such pollution existed. If the decision is upheld by the higher court where the city intends to carry it, the case will establish an important precedent.—*Science Supplement*, Dec. 3, 1926.

# An Address

ON

# THE GROWTH OF THE SPECIALTY OF ANÆSTHESIA IN CANADA*

By Samuel Johnston, M.A., M.D.

*Toronto*

ON behalf of the anæsthetists, I wish to convey to the Council of the Academy of Medicine, our thanks for establishing this Section of Anæsthesia. I would also like to express my appreciation of the honour conferred on me, in being chosen the first chairman of the section.

When it was suggested to me that I give a brief résumé at this meeting of the growth of the specialty of anæsthesia in Canada, I felt very diffident, for I did not think I was in possession of the required information for such a paper. I know I was the first physician in Canada to give up general practice and go into the specialty of anæsthesia, but of the history of the art, prior to this time, I can find no record and consequently have very little information about it.

We may all be justly proud of the realization of our life's desire, which sometimes seems like a dream come true. To see anæsthesia in Canada advance to its present position as a recognized specialty, is to behold the consummation of one's ambition, and as I stand before you to-night at the first meeting of the Section of Anæsthesia of this academy, I feel justly proud.

Like all other branches of the art of healing, anæsthesia in the beginning was very crude. It would have been just as crude as medicine or surgery, but for the lack of opportunity. Death by anæsthesia was not quite so painful or harrowing to the patient as slow death under the torture of the miscellaneous weapons of the surgeons or the bleedings and leeches of the enthusiastic physicians. At this time, almost anyone who could hold a mask and pour on some drug was allowed to administer an anæsthetic. Some of the physicians and surgeons, however, realized the seriousness and importance of anæsthesia and gave considerable attention to the subject.

Among these pioneers were the late Dr. Robert Addison Stevenson, Dr. Henry Crawford Scadding, and the late Dr. John Caven, who although not claiming to be an anæsthetist, took a keen interest in this art, and realized the need for better anæsthesia. He and Dr. Alexander Primrose were among the first to advise and encourage me to make anæsthesia a specialty and devote my entire time to it. Then come the late Dr. William Nagel, Dr. William B. Howell and Dr. Wesley Bourne, all of Montreal, all of whom made or are making anæsthesia their life work. Of these last mentioned, Dr. Howell in literary contributions and Dr. Bourne in research work have done much for anæsthesia. Colonel William Webster of Winnipeg was one of the first to take up anæsthesia in the west. Later these were followed by many others, until to-day we have 103 members in the Canadian Society of Anæsthetists. Among the younger men, mention should be made of Dr. James H. Cotton, of Toronto, whose skill as a chemist accomplished a great deal for the purification of ether.

There is one other name, without which no Canadian record of surgery or anæsthesia would be complete, the late Dr. George Peters, whose strong personality and wonderful surgical skill are well remembered by many of us. He deplored the great mortality under anæsthesia and encouraged every effort to improve existing methods and minimize to the greatest possible extent, deaths owing to faulty administration of anæsthetics.

Much credit for the growth of this specialty in Canada must be given to the Americans, who were the pioneers in anæsthesia, and without

* Read at the first meeting, Section of Anæsthesia, Academy of Medicine, Toronto, November 23, 1926.

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whose association and support we would not have attained our present status. In this connection, the name of Dr. Frank McMechan, whose writings and oratory have done so much for the cause of anæsthesia, stands foremost as the great exponent of the development of the art.

Although there are no written records of the original administration of anæsthetics in Canada that I am aware of, we do know that there was not much discrimination between the administration and the physiological action and deadly effects of the drugs used. A heritage had been handed down, "The most beneficent gift of God to suffering humanity," and up to twenty-five years ago, anæsthesia in Canada, owing to lack of vision, had not grasped the hand of help extended. Truly, "Where there is no vision, the people perish!"

I am afraid the historical beginning of the growth of anæsthesia as a specialty in Canada, will have to read very much like an autobiography, for it was as a house-surgeon in the Toronto General Hospital on Gerrard Street, in 1902-03, that I first took an interest in what was to become my life work. The hospital service at that time lacked any anæsthetic department, and the house-surgeons, regardless of their ability as anæsthetists, were called on as a matter of course, to give anæsthetics to the most difficult cases. You can have some idea of the aforementioned "ability" when I tell you that we had one lecture in anæsthesia during our entire medical course! I became particularly interested in anæsthesia as time went on, and as the other house-surgeons did not seem to relish the job, I gave the bulk of the anæsthetics, and made up my mind that it was possible to avoid most mishaps. Evidently I was working under my "lucky star" as I did not have one fatality.

On retiring from the house staff, another ex-houseman and myself were appointed as anæsthetists to the Toronto General Hospital. We instructed the house-surgeons as they came on, and supervised them until they became somewhat proficient, after which they gave many of the public ward anæsthetics. At this time, I obtained the consent of the medical faculty to give lectures in anæsthesia to the students. Then on a re-organization of the hospital staff, a Department of Anæsthesia was established and I was given the appointment of chief anæsthetist. From this nucleus, was developed the present anæsthetic service at the Toronto General Hospital. I may say that this department has been used as a model by many of the larger hospitals who were aiming to establish a department in this specialty. Many who have visited this department from England and the United States are striving to emulate it. To-day in Canada, the majority of the larger hospitals have an anæsthetic service, while nearly all of the smaller hospitals have a medical man or woman who gives special attention to anæsthesia.

It may interest you to know that in 1907, when I decided to give up general practice and devote my entire time to anæsthesia, the fee for the administration of an anæsthetic ranged from two to five dollars! Demand for more than these amounts was considered in the light of robbery, not only by the patient, but also by some of the physicians and surgeons. Little do the younger anæsthetists of to-day know of the difficulties encountered and the obstacles overcome, in blazing the trail that has led to the "asphalt" highway on which they are travelling. The earlier anæsthetists were the recipients of all sorts of insults and ignominious letters, some of which would make interesting reading for the present day anæsthetists.

After giving up general practice, I spent a considerable time in New York and Chicago, keeping in touch with any advancement in the specialty. Then in 1908-09, I went to England and studied anæsthetic conditions abroad under such eminent teachers as the late Sir Frederick Hewitt, Dudley Buxton and Probyn Williams.

In 1912, at the American Medical Association Convention, the American Association of Anæsthetists was formed, both Americans and Canadians being members. In 1915, the American Inter-State Association of Anæsthetists was formed, and again Canadians were eligible for membership. In 1920, the National Anæsthesia Research Society was established, and in the same year, so great were the strides of the specialty in Canada, that the Canadian Society of Anæsthetists was formed. In 1921, a joint meeting of the American Inter-State Association of Anæsthetists and the Canadian Society of Anæsthetists was held at Niagara

Falls, with the Ontario Medical Association, when a Canadian had the distinction of being President of both these societies. Last year, the British Medical Association chose a Canadian anæsthetist for the Presidency of the Section of Anæsthetics, and his was the honour of presiding over the world-wide Congress of Anæsthetists which met with this section of the British Medical Association last July in Nottingham. In connection with these meetings, the specialty was signally honoured in having the President of this section invited by the President of the Section of Surgery to preside at a joint meeting of the Sections of Surgery and Anæsthetics—a fitting tribute to anæsthesia and anæsthetists.

To-night we have the first meeting of the Section of Anæsthesia of the Academy of Medicine: and the end is not yet, as Dr. F. N. G. Starr, the President of the Canadian Medical Association, has intimated that it is his desire that the Association form a Section of Anæsthetics in the Canadian Medical Association. The anæsthetists in accepting this honour, are deeply appreciative of such recognition, coming as it does, from one who occupies such an eminent position in surgery.

Reviewing the progress in the administration of anæsthetics in Canada, we find that in the early days of anæsthesia, chloroform and ether were the only drugs considered safe to administer to each and all, irrespective of any pathological or other contra-indication, especially was this true of the use of chloroform. This erroneous practice has hardly disappeared yet, as evidenced by some general practitioners, to whom for some years now, I have preached the doctrine of ether as the safest drug for anæsthesia in their work, where they are obliged at times to be physician, surgeon and anæsthetist. In the last decade in our hospitals, nitrous-oxide and oxygen has come into its own, as the safest anæsthetic and the one entailing the least after-sickness and discomfort to the patient, although the most difficult anæsthetic to administer, and safe only in the hands of an expert anæsthetist. Then to-day, we have the evaluation of anæsthetic risk in pre-operative, operative, and post-operative examination and treatment, blood pressure test, etc., which reduce any guess-work in almost every case to a negligible minimum. I feel certain that the generations of the future will benefit in untold measure from the present-day scientific advancement in the art of anæsthesia.

But with all the progress in this art of anæsthesia, we feel that the teachers in this specialty are not receiving their due consideration. In McGill University and the University of Toronto, the teacher in anæsthesia has been advanced from the rank of demonstrator to that of lecturer, while in the University of Manitoba, the teacher in anæsthesia is an associate-professor. It seems to me the time is nearly ripe for the establishment of a chair in anæsthesia in universities where medicine is taught.

Because we are human and not beasts of the field, we all have within us some ambition not to have lived for nothing. Many of us try to glorify our day's work by visioning beyond the daily grind. Those of us in this particular sphere of medicine, wish, not only to build up a practice, but to do all the good we can for suffering humanity, to relieve, and where possible to eliminate pain. For this reason, we as Canadian anæsthetists stand ready to do our part, having chosen as our motto, "We safeguard those who sleep."

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To demonstrate the absolute insurance against white ants by chemical treatment of wood, the Bureau of Entomology in co-operation with the American Wood Preservers' Association has recently erected a model building in the Panama Canal Zone. It is constructed entirely of wood, not a block of which is untreated. It stands very close to the water where the white ants naturally find plenty of moisture to keep them alive. The foundation timbers were treated with coal tar creosote and the interior woodwork with chemicals such as zinc chloride which does not injure the surface for painting.—*Science Supplement,* Dec. 3, 1926.

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"The poor are my best patients because God is their paymaster," said the immortal Boerhaave.

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# An Address
## ON
# PROGNOSIS

By Egerton L. Pope, B.A., M.D., C.M., M.R.C.P. (Lond.)

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IT is a strange circumstance that a prominent phase of medical practice of such importance to the patient, hardly less important than the diagnosis itself, should receive so little attention in medical literature. In attempting to undertake a brief upon the subject, one has a feeling of enthusiasm akin to Charles Kingley's in his Ode to the North East Wind.

> "Welcome wild Noreaster,
> Shame it is to see
> Odes to every zephyr,
> Ne'er a verse to thee."

The chiropractors with their unscientific theories of disease, and their impressive methods of treatment recognize the importance of prognosis in the pursuit of their money-making profession. With them it takes on a different colour and goes by the name of salesmanship. The chiropractor is successful in direct ratio with his skill in salesmanship. He never admits defeat by disease until he is driven into a corner and pinioned. He guarantees a cure in the most unabashed manner and when the cure is not forthcoming he asserts that the treatment has not been completed. As long as the patient's credulity endures the ill-directed treatment will continue, unless the patient dies of the disease, or the chiropractor is carried off by an intercurrent infection. This is prognosis in its crude form, not based upon diagnosis and a knowledge of pathology, but upon an easily devised plan for hoodwinking the public with a few odd gestures of simulated wisdom.

Nor is the medical profession proper entirely indifferent to the effects of prognosis in relation to expediency. Not long ago there appeared in one of the comic papers a clever drawing of a seaside parade. A smartly dressed young man of intellectual mien was portrayed strolling nonchalantly along a beach. In the foreground were two beautiful Dianas clad scantily in *costumes de bain* and basking idly in the sun and sand. Said one of the beautiful Dianas, "Ah, there goes young Dr. Lettson, the most successful doctor in the city." Said the other beautiful Diana, "Oh, indeed, is he a wind-upper or a pooh-pooher?" This ingenuous and ingenious interrogation of a world-wise flapper illustrates two more or less subconscious methods that regular practitioners of medicine employ in the gentle art of satisfying their patients' demands for a prognosis. On the one hand we are all well acquainted with the alarmist who seizes upon his patient's disabilities and magnifies them to the *nth* degree of importance in order to impress the patient with the wonderful recovery that follows, if it does follow. On the other hand there is the beaming, ruddy, benignant and optimistic type of practitioner who, while recognizing to some degree, at least, the seriousness of a condition, pooh-poohs his apprehensive patient into a state of happy equanimity and mental security. These are two rough and ready methods of prognosis that serve to stamp certain practitioners with a characteristic trade-mark. Each is justified under certain conditions where the patient's disorder warrants it, and each is equally to be condemned when practised with a view to self-aggrandizement.

The term *prognosis* is defined in the dictionary as the act or art of foretelling the course of a disease from the symptoms. It is derived from the Greek $\pi\rho o$, "before," and $\gamma\iota\gamma\nu o\sigma\kappa\omega$, "I know," and therefore literally signifies "I know beforehand." The etymological meaning of the word does not imply the telling, but the knowing or rather the foreknowing. It is in the application to practice that prognosis takes on the character of an art, and comprehends the telling or foretelling. The foreknowing factor is the scientific factor and it is essentially

based upon a profound knowledge of morbid anatomy and pathology. The foretelling factor is the artistic factor, and may or may not be consistent with the scientific aspect of the subject. The foretelling factor may, indeed, be something short of artistic. It may be only artful and it is in this respect that the chiropractor or unscrupulous practitioner employs it to suit his own selfish ends, namely the prolongation of treatment and the highest assessment of his own services. Fundamentally then, there are three kinds of prognosis, the scientific, the artistic, and the artful. Let us turn our attention to some of the details of each of these.

Scientific prognosis, as implied etymologically, is the foresight of the course of a disease based upon a complete knowledge of the causes and effects of that disease in relation to the anatomical structures, and physiological workings involved in the morbid process. There is presupposed a generalized deductive process of the reasoning powers. At the same time there must be recognized another factor in scientific prognosis, and this is a generalized knowledge of morbid processes as applied to the particular individual under observation, and including his inherited and acquired idiosyncrasies together with his consequent reactions. Therefore, along with the deductive power of reasoning there is also presupposed an inductive reasoning process. Thus it becomes imperative that the most enlightened, most scientific prognosis shall be one that is based upon a thorough training in the basic sciences of clinical medicine plus a profound understanding of the individual's physique and psyche. The latter implies a long acquaintanceship with the patient's medical history and social activities such as a general family practitioner only has the opportunity of gaining, or else a very carefully noted exposition of these things from the patient, from the patient's family, and from the patient's social and business associates. In the case of young children there is a smaller element of vicissitude but even in them there is hardly less information to be gleaned from the historical study of diet, clothing, and general methods of upbringing from the time of birth.

The basis, then, of enlightened, scientific prognosis is one of an intensive study of detail in diagnosing the disease and in recognizing the individual reaction to disease. There is no place for flippancy of ideas or for allowing a wish to be father to a thought. Cold, hard, deductive, and inductive reasoning must be brought to bear upon the situation. Physicians are sometimes credited with having a sort of supernatural, intuitive power of prognosis. In the scientific sense this is only begging the question. The accredited intuition is really only the expression of long study, keen observation, and alertness of decision.

Scientific prognosis has to deal with foreseeing the course of disease in relation to three important factors of morbid processes and the patient's reactions thereto.

1. The mild.
2. The moderately severe.
3. The very severe, onslaughts of disease.

This may, on the face of it, appear to be a relatively simple procedure but experience at the bedside leads to a subtle mistrust of certain symptoms and signs that point to mildness on the one hand or to severity on the other. The phlegmatic, optimistic individual may camouflage his disease reaction in such a manner as to deceive the observer in an almost unbelievable way. One recently saw a Spartan type of parson who, on being admitted to hospital had the right leg double the size of the left, an elephantiasis type of swelling that had hardly inconvenienced this rugged man of goodly offices until he was practically unable to swing the heavy leg in the act of walking. He admitted that he had not given it a serious thought until a friend stopped him in the street a short time before, and told him that one of his legs looked much larger than the other. He then sought medical advice which led to the discovery of extensive, inoperable, sarcomatous disease of his pelvis. He died within a few weeks, just as he had lived, a truly Spartan character.

In contrast with this case, one recently saw a young married woman admitted to hospital with left sided hemiplegia, retraction of the head, an overpowering headache suggesting the possibility of meningitis or intracranial tumour, and an agonizing pain in the left iliac region, which had quite reasonably led one to consider the possible necessity of laparotomy.

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At first sight the case appeared to be a desperate one but a routine examination of the nervous system led one to make a bold diagnosis of hysteria (*sotto voce*) and to inform the patient and friends that the case was curable, and that convalescence would be established in a few days. The diagnosis was concealed, but the prognosis was calmly given with repeated assurances and suggestions even in the face of the patient's scepticism. Sodium bicarbonate, 5 gr., was given punctually every four hours for the headache and an extra dose was given at bedtime for sleeplessness. Recovery began in twenty-four hours and was complete in a fortnight. The case afforded in an early stage a splendid example of the poet's dictum "Things are not what they seem." To have named the disease to the patient at this stage, or, to have diagnosed it incorrectly, and given a grave prognosis, would likely have perpetuated the symptoms indefinitely, in the one case as the result of pique, and in the other case as the result of suggestion.

The assessment of the mildness or severity of disease is therefore not based upon mere individual symptoms nor upon the patient's statements and gestures but upon an experienced, painstaking, careful scrutiny of the body in relation to the mind, discounting or placing at a premium the one or the other in accordance with such judgment as is acquired by knowledge of disease, and of individual reaction to disease or fear of disease. Christian science would assess case number one as negligible, as imaginary, or as error; case number two as a miracle, if perchance the recovery had followed upon Christian science therapy instead of scientific prognosis artistically applied.

In addition to the assessment of disease as mild, moderately severe, or very severe, we have three concomitant considerations in making a scientific prognosis, that is to say, in foreseeing the course of the disease. They are: (1) complete recovery; (2) partial recovery, and (3) death of the patient. These do not necessarily correspond with mildness, moderate severity and great severity. For example there may be only partial recovery from a mild disease process; indeed death may follow a mild disease process, if this be so unhappily situated as to overpower the vital functions. On the other hand, complete recovery may follow a very severe disease process of long duration. For this reason it is unwise to adopt an attitude of dogmatism in prognosis. Scientific prognosis is prepared for any eventuality.

This brings us to the final phase of scientific prognosis, namely the relationship of recovery, partial recovery, or death, to the passage of time. It is the experience of most practitioners to have been told by some patient that he was "given up by the doctors" thirty years ago, as not being able to live another twenty-four hours. There is many a man in his sixth or seventh decade who was told in his twenties by a "wind-upper" that he could not live more than six months. Such mistaken forecasts are good examples of both unscientific and inartistic prognosis. They may or may not have been artful prognoses. Just as in the assessment of severity and recoverability so in the matter of time there is presupposed a profound knowledge of pathology in relation to the pathological individual. A mild disease process will last longer in one person than in another. Complete recovery may take place in a shorter time in a patient with severe disease than partial recovery requires in another patient with mild disease. There is always the question of the seed and the soil, and apart from lucky guessing the question of time had better not be assessed too precisely. Many fatal diseases are subject to long remissions, or periods of latency, and it is, therefore, a mistake to throw up one's hands in the early stages of such disorders as disseminated sclerosis or pernicious anæmia, nor is it wise to assume that a person in profound coma will die within twenty-four hours, only to find one's self pleasantly disappointed to see the coma lasting for several days and eventually ending in recovery.

Let us now turn for a moment to the second division of our subject: the artistic prognosis. By this we mean, as already stated, the foretelling of the course of disease. It implies more than the mere foreknowing. It comprehends the important practical element of imparting to the patient or his friends or to both patient and friends the outlook, the prospects of recovery, partial recovery or death and the duration of time involved. In undertaking this delicate procedure there is one predominant feature that is too frequently ignored or over-

looked and that is the welfare of the patient. Any prognostic statement that is offered to the patient should be the outcome of the physician's judgment upon the probable effect of this statement, that is to say, upon the patient's power of fighting his malady. Cases are numerous in which this conscientious procedure may be inconsistent with the pecuniary interests of the physician, but it should go without saying that the pecuniary interests of the physician are subordinate to the life and health of a patient. Every general practitioner is well aware that the moment he gives an unfavourable prognosis, he is likely to be asked for a consultant's opinion. Now it is a normal state of mentality for a general practitioner to feel a little sting, when he is confronted with what appears to be a vote of lack of confidence. Yet a practitioner is treading on dangerous ground in discouraging a request for consultation. If he takes this attitude his position in the matter is tantamount to one of self-stated self-sufficiency. Indeed he may be so self-satisfied that he cannot or will not believe that any good can come from a consultation. There are circumstances, too, in which such an attitude is the correct one, as for example when the patient or his friends nominate a consultant who is either an irregular practitioner, an unethical practitioner, or an ethical practitioner whose special knowledge does not pertain to the type of case in hand. In such circumstances the practitioner's safest course is to state plainly that he would prefer to have the opinion of someone who can be really helpful and to give the patient or friend the option of agreeing on such a consultant. If this agreement is not forthcoming there is one of two courses to pursue, first to go through with a farcical, formal consultation or second, to withdraw gracefully from the case. Circumstances may be such that one or other of these courses is the more ethical and the more beneficial for the patient. Generally speaking, when the patient loses confidence in his doctor it is high time for a change, and it is a mistake for a doctor to hold out against such odds. On the other hand, it is not essential to believe that the patient has lost confidence merely because he asks for a consultant. He merely may be desirous of avoiding any loop-hole of error or omission and under such circumstances an agreeable consultant is a source of great satisfaction to all concerned. If conditions are such that the physician believes that the best interests of the patient are at stake, and will be best served by his retirement, it is the mark of broad-mindedness and high-mindedness to withdraw in a graceful and dignified manner. A display of pique, or temper or intolerance is the mark of professional jealousy, and it were better to be credited with broad-minded *savoir-faire* than to be branded with professional jealousy. It is a terrible thing to suffer strained relations with patients, or fellow practitioners, because of the foibles of one or the other. There is no occasion to sacrifice one's self-respect in an attempt to preserve amicable relations with both, and the really big man will sacrifice his pecuniary interest in a case in order to serve his patient's welfare, and to preserve the friendship of a fellow practitioner.

So much for the outcome of a bad prognosis stated to patients or friends.

There are two occasions in which the giving of a grave prognosis to the patient himself may be justifiable.

1. Where it is necessary to frighten the patient into a realization of a dangerously careless attitude towards his disability, as for example in chronic alcoholism or drug-habits, serious heart-lesions, or other organic disease in pig-headed people, that will not listen to reason and require some drastic jolt to induce a spirit of self-discipline for the purpose of averting a tragedy.

2. In grave disorders in which a consciousness of the gravity is necessary for the arrangement of important matters of business in which the life interests of the immediate family might suffer from lack of attention to this detail.

In this latter case there is occasion for very careful judgment in balancing the effect of such prognosis, that is, whether the giving of a grave prognosis may sacrifice the odd chance of recovery, when the preservation of blissful ignorance might help the patient to fight his disease more advantageously. A careful estimate of the temperament of the patient is necessary in order to arrive at a happy decision in such a case.

In dealing with children the physician discusses the prognosis with the parents or guardians only, and generally speaking a grave or

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doubtful prognosis is even more likely to excite immediate demands for consultations than in the case of adults. In the case of the aged the greatest possible tact is required, a happy medium between an overzealous optimism, and a brutal shattering of senescent hope. The individual living to an advanced age with enjoyment of good alimentation, and mental alertness is as a rule very ambitious and does not include his death in his programme of the near future. He is generally of the opinion, and frequently not without reason, that he can do many things in a more expedient manner than his juniors. He rarely relinquishes the idea of sticking to business and earning money. Indeed, he may be inordinately ambitious. Is there anything more ungenerous than to tell such an old man that his arteries are brittle and may crack at anytime? Is not such a blow to the senile mind quite on a par with striking a crippled child on the head with a mallet? In the language of Cicero in "De Senectute":

> "This is enough to show you how, so far from being listless and sluggish, old age is even a busy time, always doing and attempting something, of course of the same nature as each man's taste had been in the previous parts of his life. Nay, do not some even add to their stock of learning? We see Solon, for instance, boasting in his poems that he grows old 'daily learning something new.'" . . . . . "My dear Laelius and Scipio, we must stand up against old age and make up for its drawbacks by taking pains. We must fight it as we should an illness."

From these various observations it is a logical deduction that as soon as a doubtful or serious prognosis becomes evident, the best course for the attending physician is to ask the patient or immediate friends for a consultation before they themselves approach the subject. Undoubtedly the most satisfactory procedure is to state tactfully and candidly that the case is one of more than ordinary severity, and that under these circumstances one would like to have a fellow practitioner with whom to discuss the case, and share the responsibility. There are few instances in which the patient or his friends have such unbounded confidence that they prefer not to have a consultation.

The artistic element in prognosis is, therefore, one that pertains to expressing to the patient or his friends, or to both the patient and his friends, the prospects of recovery, partial recovery, or death. This, as already pointed out, presupposes an estimate of temperaments. Now the outstanding type of temperament that is adversely affected by bad prognosis, and happily affected by good prognosis is the nervous type. We are all appreciative of the proverbial and somewhat mythical case that was the victim of the practical joke in which a number of people framed up a plan to tell in rotation a hypochondriacal person that he was looking very ill, the ultimate effect being an induced illness that resulted fatally. Whether such a case really existed it may be difficult to prove, but it serves to help one to imagine the very sinister results of grave prognosis, and it also serves to make one apprehensive of dealing out such grave prognoses with other than reluctant hands. On the contrary, a hypochondriacal person may be persuaded into rugged health by a good prognosis from a cheerful convincing physician.

So we come to the final phase of our subject, the artful prognosis. By this one means a prognosis given for the ulterior purpose of getting fees. As previously indicated, the irregular practitioners depend upon this for a living and it is nothing more nor less than salesmanship, such as a commercial traveller studies for the purpose of increasing his sales and incidentally his commissions. Nor is the idea exclusively confined to the irregulars. Medical men who are regarded as regular and ethical physicians, and even believe themselves in all sincerity to be such, are occasionally found to leave a trail of neurasthenia or hypochondriasis and invalidism by systematic expressions and gestures of doubt as well as suggestions of disease. There is no more unheroic character than one that tramples upon the health of one's fellow beings for the sake of gain. To shake deliberately for pecuniary reasons the normal confidence of a fellow being in himself is not by any means consistent with the classic conception of a philanthropist. It is as contrary to the spirit of the Hippocratic oath as the splitting of fees. It deserves more serious castigation than it gets, and in the logical pursuit of the offenders the cults of quackery would be relegated to the junk-heap.

In conclusion, the subject of prognosis in general is one that should be brought to the atten-

tion of our young medical men and women in the process of student training, when a doctor of medicine steps forth into the great neurotic world to gain a livelihood he should be fully conscious of the fact that he is going to be taken seriously by some of his patients, and in order to serve the best traditions of his profession he should be careful to study ways and means by which these patients shall be made stronger physically and mentally, more rugged in mind and body for their adaptation to the great struggle of life. It is his individual duty to help to make the laity strong, and to fight the natural tendency of the laity to make our profession weak. Let this attitude of mind be regarded as a part of our therapeutics, for in it lies the one distant hope of stemming the tide of quackery, that has latterly crept into the healing art, as well as into the fine arts, literature, politics, and even religion.

For the closing lines of this necessarily brief and incomplete analysis of a very important subject, one may recall the words of a poet, even as for the introductory portion,

"Thy word is a lamp unto my feet and light unto my path."

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# THE CHOLESTEROL CONTENT OF THE BLOOD PLASMA AS AN INDEX OF PROGRESS IN INSULIN-TREATED DIABETICS*

By I. M. Rabinowitch, M.D., C.M.

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THE clinical picture, urinary sugar and blood sugar are usually depended upon in estimating the progress of the diabetic. The value which may be attached to any one or a combination of any of these depends upon whether the patient does or does not require insulin.

For the diabetic not requiring insulin, the clinical picture, that is, the attitude, expression, colour and nutrition, when combined with urinalysis, is, on the whole, a fairly reliable guide. In the majority of cases, if the urines are free of sugar, it may reasonably be assumed that the blood sugar is within, or near, the normal limits of variation or at least below 0.18 per cent. The absence of sugar in urine, however, ceases to be an index of progress in those cases in which the normal threshold level of the blood sugar is raised; that is, when sugar is not excreted in the urine at the time the concentration of sugar in the blood reaches about 0.18 per cent. This may occur when the diabetes is complicated by the following conditions: (a) gross dietary indiscretions, (b) arterio-sclerosis, (c) nephritis, (d) infections, and (e) when the diabetes is of long duration. *Under these conditions a knowledge of the blood sugar is indispensable.*

For the diabetic requiring insulin, the clinical picture is not as reliable a guide as for the non-insulin cases. As a matter of fact, it may be very misleading. The temptation to take more insulin and more food than has been prescribed is particularly great. This practice, if uncontrolled, leads to a high renal threshold for sugar. Such patients may, even in the absence of nephritis, arterio-sclerosis, etc., have blood sugars ranging from 0.2 to 0.4 per cent and at the same time have no sugar in the urines. In spite of this, such patients may feel and clinically appear very well. How well they may actually be, as far as pancreatic function is concerned, may be seen from the following case.

Miss K. B., (Hosp. No. 5582-26) twenty-six years old, was referred to our clinic by Dr. J. H. Laidlaw of Ottawa. The diabetes was discovered in 1920, and since 1923 she had been taking insulin. She has found it necessary to gradually increase the amounts, and is now taking 57 units a day. In spite of this the urines frequently show sugar. Dr. Laidlaw noted a high kidney threshold on three occasions, the fasting blood sugars ranging then between 0.4

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and 0.46 per cent. There was a history of frequent dietary indiscretions.

On admission to the hospital, the patient appeared to be very well nourished and had a healthy colour. She felt well and her only reason for coming to the hospital was to adjust the insulin dosage. *The blood sugar was 0.454 per cent and the urine was free of sugar* and acetone bodies.

The following morning she felt slightly nauseated and attributed this to some article of diet or a pill she had received the day before. At this time no sugar nor acetone bodies were found in the urine. In view of the nausea she took no food. This was taken advantage of, and no insulin was given on this day in order to determine, if possible, the renal threshold. The urines were observed at frequent intervals throughout the day, and there was no glycosuria. During the night the nausea became more marked and she vomited twice. At 8 a.m. the following morning she was practically in coma. The blood sugar then was 0.540 per cent and both sugar and acetone bodies were found in the urine. With insulin she recovered and is now well.

What had actually produced the nausea at first is rather difficult to determine. Undoubtedly the discontinuance of the insulin assisted in bringing on coma. The important point, however, is that we have here a patient appearing to be and feeling very well, taking more food than has been prescribed and more insulin in an attempt to balance this excess. Because of this the blood sugar is very high but this is not shown by the urine. With this practice of "more insulin and more food" not only had her tolerance for carbohydrates not increased under the use of insulin, but because of abusing it, the pancreatic function was destroyed to such an extent, that in the absence of it *for one day* only, she was brought to the stage of coma. It is obvious that under these conditions both the clinical picture and the urinalysis are unreliable and a knowledge of the blood sugar is indispensable.

It would appear from the foregoing observations that the blood sugar is the best index of all three measures. Unfortunately, it also fails at times. Diabetics may, though infrequently, in spite of having normal blood sugars, develop carbuncles, neuritis and even gangrene. Have we therefore any other index of progress?

In 1917, Joslin, Bloor and Gray[1] recorded their observations on the blood lipoids in diabetes. These authors by correlating their laboratory data with the various clinical types of diabetes, showed that "all types of diabetes are distinguished by a marked increase in the lipoids of the blood, and the general statement can be made that the increase is progressive with the seriousness of the disease." A rather important observation was that there was no parallelism between the blood sugars and lipoid fluctuations, and that the blood sugar was not nearly as accurate a test of the severity of the disease as was the blood lipoids. In a more detailed study one of the workers of this group[2] again demonstrated a relationship between the lipoid content of the blood and prognosis. "The longer the duration of the disease before examination the lower the blood fat, presumably because those patients live long who have low fats, that is, mild diabetics." In his recent monograph Joslin[3] briefly summarizes our present knowledge of the physiology of blood lipoids, and in a very striking manner further illustrates the prognostic value of their determination. In a survey of the more recent literature on clinical studies of diabetes, one finds that references to blood lipoids are remarkably conspicuous by their absence. An explanation of this is rather difficult in view of the above observations, the technical simplicity with which the test can be carried out, and the small amounts of blood required.

In our clinic we have confined our studies to the cholesterol fraction of the lipoids, and have preferred plasma to whole blood for several reasons. Firstly, cholesterol is a relatively stable chemical compound. Secondly, cholesterol values have been found to run parallel with the total fatty acids, and lastly it has been demonstrated that the plasma affords the best index of changes in the lipoids of the blood. As in the case of blood sugar estimation, all observations were made on blood obtained in the fasting state. The technique described by Bloor[5] is very simple and is as follows:

*Preparation of the sample.*—Three c.c. of plasma are run slowly (a slow stream of drops) from a pipette into about 75 c.c. of a mixture of re-distilled alcohol and ether (3 parts alcohol 1 part ether) in a 100 c.c. graduated flask. The contents of the flask should be kept in motion during the process so that there is no clumping

of the precipitated material. The contents of the flask are raised to boiling by immersion in a water bath (with constant shaking to avoid superheating), cooled to room temperature, filled to the mark with alcohol ether, mixed and filtered. The filtered liquid if placed in a tightly stoppered bottle in the dark will keep unchanged for a considerable time so that if it is not convenient to complete the determination at once, the sample may be carried to the above stage and left till a more suitable time.

By running the blood slowly into the large quantity of alcohol-ether as above, the protein material is precipitated in finely divided form and under these conditions the short heating combined with the great excess of solvent is adequate for complete extraction of the serum of the plasma. The extraction, while not so complete in the case of whole blood, is believed to be better (because of the higher values obtained) than that obtained by any other method in use at the present time.

*Determination.*—Ten c.c. of the alcohol-ether extract are measured into a small flat-bottomed beaker and evaporated *just to* dryness on a water bath or electric stove. Any heating after dryness is reached produces a brownish colour which passes into the chloroform and renders the subsequent determination difficult or impossible. The cholesterol is extracted* from the dry residue by boiling out three or four times with successive small portions of chloroform, and decanting into a 10 c.c. glass-stoppered, graduated cylinder which has previously been calibrated. The combined extracts after cooling (5 c.c. or less) are then made up to 5 c.c. The solution should be colourless but not necessarily clear, since the slight turbidity clears up on adding the reagents. Five c.c. of a standard cholesterol solution in chloroform† (containing 0.5 mg. of cholesterol) are measured into a similar 10 c.c. cylinder.

To each of the solutions are added 2 c.c. of acetic anhydride and 0.1 c.c. of concentrated sulphuric acid, the solutions mixed by inverting several times, then set away in the dark for fifteen minutes, after which they are transferred to the cups of the colorimeter (Dubosecq) and compared as usual, setting the standard at 15 mm. The cement of the colorimeter cups must, of course, not be soluble in chloroform; plaster of Paris has been found satisfactory, or even ordinary glue if the cups are not used for any other purpose. In using the colorimeter in this determination the window screen described by Folin and Denis has been found valuable. The error of the above method when carried out with ordinary care is 4 to 5 per cent. If greater accuracy is desired it may be obtained, at the expense of more material and time, by using 50 c.c. of the alcohol-ether extract, evaporating as above, extracting with larger quantities of chloroform, making the extracts to 25 c.c. and taking an aliquot of 5 c.c. for determination.

As a result of our studies we are entirely in agreement with the Boston workers that the lipoid content of the blood is a better index of the course of the disease than the blood sugar, Patients may on discharge from the hospital have normal blood sugars and urines free of sugar. In many of these cases the cholesterol content of the blood is increased. Observing these patients as they return to the Out-Door Clinic, differences in progress are noted. The patient, though with a normal blood sugar, but with high cholesterol, does not, on the average, appear to run the same uneventful course for the same length of time as the patient who not only has a normal blood sugar but also a normal cholesterol. With high cholesterols, the slightest dietary indiscretions result in more marked and more persistent hyperglycæmias than with normal cholesterols. Hyperglycæmias resulting from slight illnesses, appear also to be more frequent with high than with normal cholesterols, and with the former the incidence of neuritis and of vascular changes is greater. (Though neuritis and even gangrene may be observed in individuals with normal cholesterols the number of such cases is not sufficiently great to affect the rule). The relationship between high blood cholesterols and gangrene is striking. In the following discussion we are particularly concerned with the cholesterol findings in insulin-treated patients.

It is generally recognized that, as stated above, a diabetic receiving insulin, though having a

* In order to get an adequate extraction with the small amounts of chloroform used, an excess (3 or 4 c.c.) should be added each time and the mixture allowed to boil down to half its volume or less, before decanting.

† It is convenient to make the cholesterol standard in two strengths: (a) the stock solution containing 0.2 gm. of cholesterol (Kahlbaum) in 200 c.c. chloroform; and (b) the standard solution for use made by diluting 10 c.c. of the above to 100 c.c. with chloroform. 5 c.c. of this latter solution will contain 0.5 mg.

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marked hyperglycæmia and glycosuria may feel and clinically appear to be, very well. It seems that, because of this, some workers in this field have actually gone on record as minimizing the significance of traces of sugar in urine, and also discounting mild degrees of hyperglycæmia. It is rather difficult, in view of our conception of diabetes, to be in accord with this view. We have sought, however, to test this idea by cholesterol studies. In drawing conclusions, we are assuming that an increased blood cholesterol is not compatible with favourable progress, that is, *improvement in pancreatic function.*

*Method of investigation.*—Observations were made upon 254 individuals, ninety-one of which required insulin. Both insulin and non-insulin patients were grouped according to the blood and urinary sugar findings: Thus Group (a) blood sugar normal in the fasting state. Group (b) blood sugar below 0.18 per cent in the fasting state. Group (c) blood sugar above 0.18 per cent in the fasting state: glycosuria. Group (d) blood sugar above 0.18 per cent in the fasting state: no glycosuria.

In each group the maximum, minimum and average cholesterol percentages were calculated. The incidence of normal values was also calculated in each group. The combined data are recorded in the accompanying table.

Since the blood sugar is not necessarily an index of the severity of the disease and since its variations do not always parallel those of the blood lipoids, an explanation of the above method of grouping is necessary. Firstly, the cases have been classified according to severity, otherwise some of these would not be receiving insulin. The classification was that generally employed in this clinic.[5] Secondly in this study we are chiefly concerned with *progress.* Of the three methods usually used in estimating progress, the clinical picture, urinary sugar, and blood sugar, the latter is the most reliable.

*Discussion of results.*—It will be noted that when the blood sugar was normal in the fasting state, the average cholesterol percentage was normal, and approximately the same in the insulin and non-insulin group. The percentage incidence of normal values tended to be less in the patients requiring insulin.

With patients having mild degrees of hyperglycæmia in the fasting state, some differences were noted between the insulin and non-insulin patients. In the insulin group the average cholesterol percentage was above the accepted normal (0.23 per cent) and the maximum value was also higher. The incidence of normal values was less than in the group of patients with normal blood sugars and definitely lower in the insulin than in the non-insulin group.

With marked degrees of hyperglycæmia, *i.e.* blood sugars beyond 0.18 per cent in the fasting state, all the maximum percentages were

Cholesterol Percentages in Insulin and Non-Insulin Treated Diabetics

| *Group* | *Normal blood sugar* | | *Blood sugar less than 0.180%* | | *Blood sugar greater than 0.180% Glycosuria* | | *Blood sugar greater than 0.180% No glycosuria* | |
|---|---|---|---|---|---|---|---|---|
| | *No insulin* | *Insulin* | *No insulin* | *Insulin* | *No insulin* | *Insulin* | *No insulin* | *Insulin* |
| Number of cases | 82 | 18 | 40 | 39 | 27 | 16 | 14 | 18 |
| Maximum percentage of cholesterol | 0.317 | 0.284 | 0.432 | 0.516 | 0.573 | 0.611 | 0.564 | 0.500 |
| Minimum percentage of cholesterol | 0.158 | 0.186 | 0.182 | 0.167 | 0.178 | 0.197 | 0.219 | 0.178 |
| Average percentage of cholesterol | 0.205 | 0.208 | 0.230 | 0.258 | 0.262 | 0.317 | 0.354 | 0.307 |
| Normal values: | | | | | | | | |
| Number | 54 | 11 | 23 | 9 | 10 | 4 | 4 | 6 |
| Percent | 65.8 | 61.6 | 57.5 | 23.0 | 37.0 | 25.0 | 28.5 | 27.7 |

higher than in the above two groups. All the minimum percentages were within the normal limits of variation. A marked decrease in incidence of normal values was noted whether the patient did or did not require insulin, and whether glycosuria was present or absent.

If the cholesterol content of the blood is an index of prognosis (and this has been definitely demonstrated) the conclusions from the above observations are obvious.

*Conclusions*

1. Hyperglycæmia indicates active diabetes, whether the individual does or does not show sugar in the urine.

2. Insulin-treated patients cannot be said to have improved, as far as their pancreatic function is concerned, unless the blood sugar in the fasting state is normal. The clinical picture fails to be an index of progress in such cases. This was strikingly demonstrated in the case referred to above.

3. The corollary to these conclusions is that to allow patients to take food in excess of their requirements by allowing more insulin is not ideal practice, since the ultimate aim in treatment should be improvement of the pancreatic function and not merely keeping the individual alive.

4. In view of the small quantities of blood required, and the simplicity and rapidity with which the percentage cholesterol can be determined, this test should be a routine procedure in the care of the diabetic.

5. As with all other laboratory procedures, in the interpretation of results, it is necessary to consider other conditions which may result in increased blood cholesterols, *e.g.*, nephrosis, pregnancy, hepatic disorders, especially obstruction of the biliary passages, occasionally arterio-sclerosis and hemiplegia.

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# THE TREATMENT OF DIABETES MELLITUS THROUGH OFFICE PRACTICE*

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THE diabetic individual is fundamentally suffering from an impairment of the internal secretion of the pancreas. This altered function may be due to a temporary depression not associated with altered histological change, or may be definitely a sequel to such change. Secondarily, other physiological functions become deranged; the storage of liver and muscle glycogen, the oxidation of glucose by the tissues, the incomplete combustion of fatty acid with the accumulation of ketone bodies in the blood; hyperglycæmia and glycosuria appear.

Since the diagnosis of diabetes mellitus is not a positive one other causes for glycosuria must be excluded before its certainty can be established. In true diabetes there is usually a group of symptoms, the two most noteworthy being thirst and polyuria which are closely associated with glycosuria, and with glycosuria there is always hyperglycæmia. The condition of renal glycosuria, a local increased permeability of the kidney for glucose, is most commonly confused with true diabetes. But here the blood sugar is always within the normal limits, the glycosuria is little influenced by the diet, and the characteristic symptoms of diabetes mellitus are absent. In hyperthyroidism, hyper-adrenemia, and in other conditions where there is hyperstimulation of the sympathetic nervous system resulting

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in increased mobilization of glycogen from the liver you will find glycosuria associated with hyperglycæmia, but a clinical study will eliminate their presence.

The etiology of this disturbed pancreatic function is still obscure in the majority of cases. Infection of the gall bladder tract is of definite causal relationship in a limited number. Arteriosclerosis, developing in late middle life, which involves the pancreas, also accounts for a large group of low grade cases. I believe that the generalized arterial change results in impaired pancreatic circulation leading to alteration of cell function. Acute systemic infection is not infrequently followed by the development of true diabetes. That the onset of obesity, especially if rapidly acquired, is a predisposing factor has been well established by Joslin. How the accumulation of excess body fat influences the pancreatic function is not understood. Finally, there is no doubt but that certain individuals inherit a potentially limited pancreatic reserve, this weakness manifesting itself as a rule before twenty years of age in an impairment of its internal secretion.

The fundamental principle in the treatment of diabetes mellitus is the rest of a weakened function. Do not call upon the organ to do more than it can. Since the purpose of this internal secretion in the body is to do with the proper storage and oxidation of glucose, the therapeutic indication is to limit the amount of glucose entering the body in proportion to the amount that it can properly handle. And this must be done by dietetic means.

The ultimate purpose in the dietetic treatment is the establishment of the patient upon what might suitably be termed a "maintenance diet." This diet must fulfil certain qualifications. Firstly, it must contain sufficient calories to maintain weight. It must also contain enough protein to keep your patient in nitrogen equilibrium, and this can be safely judged by a maintenance of weight. Also there should be no glycosuria, which implies in most cases an approximately normal blood sugar, and the urine should show no ketone bodies. If this can be accomplished without insulin the latter is not necessary; if it cannot, then insulin must be used as an aid to the capacity of the patient for storing and oxidizing glucose. Only under such circumstances in the routine treatment of the uncomplicated case is insulin indicated.

To arrive at this "maintenance diet" a preliminary period of a low diet should be given in order to allow your patient to regain as much of his impaired carbohydrate tolerance as possible. In all except the severe cases such a period abolishes hyperglycæmia and glycosuria, allowing the patient considerable rest of the overstrained function. Then by gradual steps increases in the diet may be made until the maintenance level is reached.

Of equal importance to the dietetic adjustment is the instruction of your patient. The more diabetics know about diabetes and the daily handling of their case the longer they will live. They must not be allowed to remain in ignorance of their condition, but they must take as intelligent an interest in their case as their mental capacity allows. The information that should be imparted to the patient may be classified under the following headings:

1. The nature of diabetes and, in brief, the disordered physiological functions in the body.
2. The purpose of the dietetic control.
3. The uselessness of drugs.
4. The daily hygiene of the body from the prophylactic point of view (skin, mouth, feet).
5. The food factors in a diet, and the approximation or the accurate calculation of the same.
6. The preparation of special foods (substitutes for bread).
7. The examination of the urine for sugar and diacetic acid; and, when necessary:
8. The nature of insulin; when indicated in treatment, its administration, danger, and the emergency treatment of hypoglycæmia.
9. This to be supplemented by reading (Joslin's *Diabetic Manual,* etc.).

This instruction may seem to some to be too extensive but I am convinced that it is the foundation stone in the successful treatment of a diabetic. To the physician the details may appear too time consuming, but I would plead that no physician can with a clear conscience treat cases of diabetes to-day unless he is willing to acquire a little special knowledge of the condition and equip his office in part with that in view. To the patient freedom from symptoms

and a productive capacity and ultimate prolongation of life is his reward, and the doctor can assure his patient of such in return for intelligent and detailed co-operation.

In the handling of cases of diabetes mellitus I am sure the question arises in the minds of physicians: why control all cases of diabetes? When the onset of diabetes occurs during youth or in middle age we all feel, I am sure, that the case should be strictly controlled. But when diabetes appear in individuals beyond fifty years of age there is considerable laxity on the part of many in the handling of such cases. We know that usually the disturbance of function is not severe and that few symptoms are complained of. Nevertheless, if we allow these low grade cases to have continuous hyperglycæmia the progress of the pancreatic lesions is more rapid and their susceptibility to complications is greatly increased. Rarely does the controlled case, even with rather extensive arterial change develop gangrene of an extremity, while gangrene in the uncontrolled low grade case is the commonest complication. And to-day gangrene of an extremity is more fatal than diabetic coma. Accordingly, I would urge you to control all cases of diabetes mellitus, the young because it is imperative, and the aged to avoid the more serious complications.

In order to make the routine handling of the uncomplicated case of diabetes more comprehensive, I will submit a scheme of treatment to show what may be accomplished by a series of calls at the physician's office.

First Visit

1. *Make the diagnosis.*
2. *Remove, if possible, any etiological factors discovered.*
3. *Instructions to patient.*

A. *A talk on the nature of diabetes.* He can live under a different regime. He must agree to a certain code—that should be the understanding—essentially up to the patient. Doctor's duty is to instruct, encourage, and support.
B. *Importance of diet.*
C. *Uselessness of drugs.*
D. *Choice of 5 per cent and 10 per cent* carbohydrate vegetables and fruits (a card for the same).
E. *Examination of urine for sugar* (Benedict's qualitative method).
F. *Preparation of report.* (Form for same).

4. *Diet for patient* (for three days).
Clear soups,
Meat or fish (any kind),
Eggs, cream, butter,
5 per cent or 10 per cent C.H.O. vegetables or fruits,
1 glass of milk a day,
Oatmeal or shredded wheat biscuit,
1 slice of bread per day. (*See table below*)

Second Visit (*after three days*)

To bring back report filled out.
If patient is free from glycosuria, essentially a mild case.
If glycosuria persists—more severe.

1. *Instructions to patient.*
Have patient explain instructions of first visit.
*First lesson* in food values and calculation of diet.
*Units:* Weight: 1 gramme Demonstrate with scale
Measure: 1 c.c. and cup.
Heat: 1 calorie.

Diabetes

Foods arranged approximately according to content of carbohydrate. (Joslin). Vegetables (fresh or canned)

| *5 per cent* | *10 per cent* | *15 per cent* | *20 per cent* |
|---|---|---|---|
| Lettuce | String beans | Green peas | Potatoes |
| Cucumbers | Pumpkin | Artichokes | Shell beans |
| Spinach | Turnip | Parsnip | Baked beans |
| Asparagus | Squash | Canned lima beans | Green corn |
| Rhubarb | Beets | | Boiled rice |
| Endive | Carrots | | Boiled macaroni |
| Marrow | Onions | | |
| Beet greens | Green peas, canned | | |
| Dandelion greens | | | |
| Celery | | | |
| Tomatoes | | | |
| Brussel sprouts | | | |
| Cauliflower | | | |
| Egg plant | | | |
| Cabbage | | | |
| Radishes | | | |
| String beans, canned | | | |
| Artichokes, canned | | | |
| | Fruits | | |
| Ripe olive (20 per cent fat) | Watermelon | Raspberries | Plums |
| Grapefruit | Strawberries | Currants | Bananas |
| | Lemons | Apricots | Prunes |
| | Cranberries | Pears | |
| | Peaches | Apples | |
| | Pineapple | Huckleberries | |
| | Blackberries | Blueberries | |
| | Gooseberries | Cherries | |
| | Oranges | | |

WEEKLY REPORT (*Sample*)

| Date | Diet | | | Urine | | Insulin | | |
|---|---|---|---|---|---|---|---|---|
| | *Prot.* | *Fat* | *C.H.O.* | *Sugar* | *Acid* | *A.M.* | *N.* | *P.M.* |
| | *gm.* | *gm.* | *gm.* | + or — | + or — | *Units* | | |
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| | | | | | | | | |

Name..... Weight.....

*Source of Heat—Protein—Fat—C.H.O.*
1 gramme P = 4 cal.
1 gramme F = 9 cal.
1 gramme C.H.O. = 4 cal.
Foods high in protein—Fat—C.H.O.
Food values expressed in per cent.
Tables of values of common foods—per cent of P.–F.–C.H.O. (All prepared)—(Use whole figures only).
*Work: Simple Calculations.* (2 rules).
*e.g.* How many grammes of C.H.O. in 50 grammes of grape fruit?
How many grammes of butter will make 25 grammes of fat?
*Urinalysis:* Ferric chloride test.
*Reading:* Joslin's "Diabetic Manual."

2. *Diet:* Same except eliminate bread and more than one tablespoonful of oatmeal (cooked)—also 10 per cent vegetables and 10 per cent fruits.
To remain on this low diet for three days; then return to doctor.

FOOD VALUES (*Sample*)

| *Food* | *Protein per cent* | *Fat per cent* | *Carbohydrate per cent* |
|---|---|---|---|
| Cabbage | 2 | .. | 5 |
| String beans (fresh) | 2 | .. | 6 |
| Potatoes | 2 | .. | 20 |
| Grapefruit | .. | .. | 5 |
| Orange | .. | .. | 10 |
| Milk, whole | 3 | 4 | 5 |
| Cream, 15 per cent | 2 | 15 | 4 |
| Butter | .. | 85 | .. |
| Egg (one) | 7 | 5 | .. |

RULES FOR FIGURING DIETS

*Rule I.* When you have any amount of food and want to find out protein, fat, or carbohydrate content: Amount x percentage value in food = gms. of P. and F.

Divided by 100
or C.H.O. in that amount of food.

*Example:* How many grammes of C.H.O. in 90 grammes of onions?
90 x 9 = 810 = 8.1 gms.
100 100

*Rule II.* When you know per cent value of food and want to find out number of grammes of food to weigh to make a definite number of grammes of C.H.O., P. or F.: Take: gms. wanted x 100 = No. of

Percentage value

grammes of food that will contain desired amount of P.F. or C.H.O.
*Example:* How many grammes of cabbage will contain 7 grammes of C.H.O.?
7 x 100 = 700 = 140 gms. of cabbage.
5 5

THIRD VISIT (*after three days*)

Review of instructions of second visit.
*Calculation of a simple diet for one meal.*
Such as: P. 20, F. 40, C.H.O. 20.
*Balancing of diets:* C.H.O. First,
Prot. Next,
Fat, Last.
Practice with scale and measuring cup.
Preparation of muffin—substitute for bread.
*Sample Meal* (breakfast). P. 20, F. 40, C.H.O. 20

| *Food* | *Amount* | *Protein* | *Fat* | *C.H.O.* |
|---|---|---|---|---|
| Grapefruit | 80 | 0 | 0 | 4 |
| Oatmeal (cooked) | 100 | 3 | 0 | 12 |
| Cream, 15 per cent | 100 | 2 | 15 | 4 |
| Egg | 1 | 7 | 5 | 0 |
| Muffin | 1 | 2 | 11 | 0 |
| Butter | 11 | 0 | 9 | 0 |
| Bacon, crisp | 60 | 6 | 0 | 0 |
| Total | | 20 | 40 | 20 |

*Work for home:* Figuring of a diet, P. 60, F. 150, C.H.O. 60. One-third for each meal. (To bring calculated diet back at next visit).
Encouragement with Joslin's "Manual."
Supply scale and measuring cup.
*Directions for diet:* To return to first day's diet without bread—substitute special muffin.

*Diabetic Muffin*

1 cup boiled bran,
½ teaspoon baking soda, (level),
½ teaspoon salt. No food value,
¼ teaspoon cinnamon, (if desired).

| | *Protein* | *Fat* | *C.H.O.* |
|---|---|---|---|
| 1 whole egg..... | 7.5 | 5.3 | ... |
| 1 egg white..... | 4.0 | .... | ... |
| Butter, 70 grammes... | ... | 59.5 | ... |
| Buttermilk, 80 c.c..... | 2.4 | 0.4 | 3.8 |
| Total..... | 13.9 | 65.2 | 3.8 |

Bacon fat 60 grammes may be substituted for butter 70 grammes.

*Method:* Boil bran in the usual way. Then dry by placing in the oven.

Melt butter and add to bran. Then add the buttermilk in which the baking soda has been dissolved. Add beaten egg yolk and salt. Lastly, fold in the well beaten egg whites.

Bake in greased muffin tins, dividing above amount into six.

| | *Protein* | *Fat* | *C.H.O.* |
|---|---|---|---|
| Each muffin has for value..... | 2 | 11 | 0 |

*A Method to Render Bran Free from Carbohydrate by Boiling*

2 cups of feed bran, 2 quarts of water — For the 1st and 2nd boilings,

2 cups of feed bran, 1 quart of water — For the 3rd boiling.

Put the bran and the two quarts of cold water in a large kettle and heat to boiling, and boil for fifteen minutes. Then pour the bran on to a sieve, over which one thickness of gauze has been placed. Then run from a faucet, or pour cold water through the sieve, for one minute. Place the bran in two more quarts of cold water back upon the stove and again boil for fifteen minutes (second boiling). Repeat the process as at the end of the first boiling. Then boil for the third period of fifteen minutes, using one quart of water. Drain, and dry the bran out in a warm oven.

FOURTH VISIT (*After three days*)

Calculation of diets now complete.
Have working equipment.
*Order known diet.* P—F—C.H.O. in grammes.
*Diet:* Based on weight: 2.2 lbs. = 1 kg.
Protein: 1 gm. per kg.
Fat: 1 gm. per kg.
C.H.O.: ½ gm. per kg.
*When necessary:* Start insulin instruction.
What it is. When its use is justified. How determined. Have patient read some literature on insulin.

FIFTH VISIT (*After three more days*)

Diet changes to be made every three days.
Increase to "Maintenance Diet."
Protein first,
Fat and C.H.O. next.
*Maintenance Diet.*
Protein: 60–70 gms. (about 1 gm. per kg.)
Fat: 150–170 gms. (occupation)
C.H.O.: 50–100 gms. (severity)
*Insulin—When to be used—Determined by glycosuria.*
Not justified if "Maintenance Diet" can be reached without glycosuria.
*If used* Dosage—how arranged.
Sterilization of needle—injection—danger—hypoglycæmia—treatment.

WHAT HAS BEEN ACCOMPLISHED

1. Patient has been standardized on a "Maintenance Diet."
2. Education of patient.
   - A. Nature of diabetes,
   - B. Diet is foundation stone,
   - C. Calculation of diets,
   - D. Preparation of bread substitute,
   - E. Urinalysis: sugar and diacetic acid,
   - F. Report system,
   - G. Insulin (when necessary).

EQUIPMENT FOR PATIENT

1. Joslin's "Manual,"
2. Food value sheets,
3. Scales (Chatillon or Hanson), and measuring cup,
4. Urinalysis outfit: (*a*) Benedict's qual. soln., (*b*) Ferric chloride: 5 per cent soln., (*c*) Test tubes,
5. Insulin equipment: (*a*) Alcohol, (*b*) Iodine, (*c*) Syringe, (*d*) Glucose powders.

SPECIAL EQUIPMENT FOR PHYSICIAN

1. Food value sheets (including 5 per cent and 10 per cent vegetable and fruit card),
2. Weekly report sheets,
3. Sample scales and measuring cup.
4. Recipe for muffins,
5. Sample urinalysis outfit,
6. Sample insulin outfit.

This procedure may appear too detailed but if the doctor is willing to systematize his methods of handling these cases, adopting a definite procedure for each consecutive visit a great deal can be accomplished. Give the patient a start and guidance in reading matter, and many will teach themselves. Have the patient keep a notebook in which a store of information will be rapidly accumulated. This can be used for future reference.

I realize quite well that there are many patients who will be unable to learn to calculate diets. In such cases the actual use of the scale can be taught, and they can follow a diet written out by the doctor, or in other instances an approximated diet will give satisfactory results. Visual approximation can be rapidly acquired, and with the urine as a check, it is frequently a satisfactory method of handling the diet. However, the intelligent patient has the right to know more, and if the attending physician fails to see his way clear to impart that knowledge, he should be referred to someone who does.

To-day the future for most diabetics is bright. Most of the children are growing and developing normally, the middle aged patient is at least holding his own, and in many instances is probably gaining in his own production of insulin. Life is undoubtedly being prolonged. This change is largely due to insulin, the great aid in the treatment of diabetes mellitus.

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# THE RELATION OF KIDNEY ACTIVITY IN DIABETES INSIPIDUS TO THE THEORIES OF URINE EXCRETION*

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IN presenting this paper the writer wishes to point out that the original intention was to study the chemical composition of dilute urines and to attempt to correlate the findings with kidney activity and the theories of urine excretion. An opportunity was afforded to study the urine from a case of diabetes insipidus. This subject voided between twenty and twenty-five pints per day, and a careful analysis of this urine was thought to be of interest.

The problem of kidney function in diabetes insipidus, in its relation to the theories of urine excretion, is approached firstly, by presenting the history of diabetes insipidus; secondly, by discussing the theories of urine excretion; and thirdly, by a careful examination of the urine voided by the subject recorded above. Additional studies were made on students in whom polyuria was induced by the ingestion of large quantities of water.

A few interesting points presented themselves during the analyses. The composition of the urine in the case of diabetes insipidus differed from the urines of the other polyuric subjects in the absence of creatinine and inosite and the presence of a substance of unknown composition which turned purple on standing. (Table I).

*History of diabetes insipidus.*—M. Bessyon de la Chassaigne in the Paris *Journal* of May 1, 1789, first reported a case of a woman who suffered from a burning thirst. The nature of the phenomenon was not then known. In 1792, Simmons[35] first reported two cases of diabetes insipidus. In 1794, Frank[12] defined it as "a long-continued abnormally increased secretion of non-saccharine urine which is not caused by a diseased condition of the kidneys." Watson,[40] in his lecture in 1856, called it a "chronic diuresis", and noted that the desire to drink is first noticed, and that the specific gravity of the urine was 1,002. He also made the observation that liquid may be absorbed into the body from the atmosphere, either by the skin, pulmonary mucous membrane, or by both. He records his embarrassment because his horse which suffered from polyuria, continually soiled the ground in front of every house at which he halted. He found no sugar in the urine of his horse. Hilton Fagge[9] in 1886 gave the following detailed description of a case of the disease: "The

* From the Department of Biochemistry, McGill University, Montreal. The writer is indebted to Drs. McIntosh and Mason of the Royal Victoria Hospital of Montreal for the material made available for this investigation.

TABLE I

Urinalyses in a Case of Diabetes Insipidus

| Date | Intake c.c. | Output c.c. | Nitrogen per cent | Nitrogen total | Chlorides per cent | Chlorides total |
|---|---|---|---|---|---|---|
| 1924 | | | | | | |
| March 21 | | 15,520 | | | | |
| " 24 | 12,920 | 13,200 | | | | |
| " 26 | 12,960 | 13,590 | 0.112 | 14.41 | 0.095 | 11.23 |
| " 27 | 13,320 | 14,130 | 0.102 | 13.10 | 0.095 | 12.17 |
| " 28 | 13,450 | 15,380 | | | | |
| " 31 | 13,320 | 13,950 | 0.098 | 13.67 | 0.01 | 13.95 |
| April 1 | 11,520 | 5,400 | 0.0924 | 4.99 | 0.07 | 3.78 |
| " 2 | 1,098 | 12,380 | 0.1092 | 13.41 | 0.08 | 9.90 |
| " 3 | 11,160 | 9,140 | 0.0952 | 8.70 | 0.085 | 7.77 |
| " 4 | 12,520 | 13,680 | 0.1120 | 15.32 | 0.085 | 11.63 |
| " 5 | 11,880 | 10,240 | 0.1330 | 13.61 | 0.0135 | 13.82 |
| " 6 | 12,520 | 10,650 | 0.1008 | 10.73 | 0.110 | 11.72 |
| " 7 | 12,240 | 11,420 | 0.0882 | 10.07 | 0.135 | 15.42 |
| " 8 | 10,260 | 6,900 | 0.0882 | 6.08 | 0.115 | 7.90 |

volume of urine was large varying between thirty and forty pints. The specific gravity was low varying between 1,003 and 1,007. The urine was clear, colourless, faintly acid in reaction and contained no sugar. Inosite was not necessarily present. The total quantity of urea excreted was increased and early ammoniacal fermentation was noted. Clinically there was frequency, tormenting thirst and disturbance in body weight."

The disease occurs in infancy and may be familial; the parents have been noted to suffer from diabetes mellitus or albuminuria. It has been attributed to blows on the head or organic lesions of the brain and has been produced experimentally in animals by brain injury.

Mohr[29] points out that polyuria is primary, and the polydipsia secondary, and attributes the diuresis to a high albumen content of the blood. The cause of the polyuria may be organic or functional. Conditions increasing the rate of oxidation may be an etiological factor, such as, disease of the hypophysis cerebri, or of the thyroid. He also observes that the normal kidney regulates the osmotic equilibrium of the fluids by the elimination of metabolic residues in two ways, namely (a) varying the quantity and (b) the concentration of the urine. Under normal conditions the kidneys are able to vary the volume and concentration of the urine according to physiological requirements. The kidneys in the case of diabetes insipidus are unable to concentrate and therefore polyuria results. Fitz[10] in a summary of his paper points out three much discussed theories in regard to the pathology and physiology of the disease; firstly, that it is due to faulty concentration powers on the part of the kidneys; secondly, that it is a primary polydipsia with normal renal function, and thirdly, that it is a symptomatic polyuria induced by stimulation of the kidney from a variety of causes. In a certain number of cases this may be due to hypersecretion of the hypophysis, a condition often of syphilitic origin. Rabinowitch[33] in 1921 made some endocrine studies and in his case an endocrine and a renal factor were found. Willis[41] in 1674 differentiated between urine with and without a sweet taste in polyuric patients. It is doubtful, however, whether he referred to the insipidus type, since he relied on the taste. Kenneway and Mottram[19] believe that diabetes insipidus is always associated with some lesion of the pituitary gland, and found no record in which abnormality of the gland was excluded with certainty at the autopsy table. Cushing,[4] in experiments in which he divided the pituitary stalk, with or without partial removal of the gland of the dog, was able to show an enduring polyuria. Towne[39] reports a case of cessation of diabetes insipidus after Roentgen ray treatment of the pituitary gland. No other form of treatment was given to this patient.

Diabetes insipidus is comparatively rare. Rabinowitch's[33] case was one of 50,000 admissions and Fritz[10] estimated that out of 553,077 cases from the medical clinic at Zurich, the Charité in Berlin and the Johns Hopkins Hospital and Dispensary, only seventy-nine were found. Towne[39] combining the statistics of Fitz, Rowntree and Williams, based on more than 3,000,000 hospital admissions shows the incidence to be 16.5 per hundred thousand. Maranon[25] himself reports fifty-one cases. Osler[32] states the disease to be most common in young persons. Males are more frequently attacked than females. The affection may be congenital.

*Theories of urine excretion.**—Bowman[3] in 1842 held that the kidney secretes urine just as the submaxillary gland secretes saliva. Two years later Ludwig[21] described the glomerular capsule as a simple filter for everything except protein. In his opinion urine formation took place in the tubules. Cushny[5] opposed this view, and pointed out that this would mean that the cell was able to differentiate between the ordinary and foreign constituents of the plasma, and advanced the theory of threshold bodies. Macallum[22] definitely demonstrated the secretion of acid by the proximal convoluted tubules. Macallum and Benson's[24] experiments of administering copious drafts of water to human beings were repeated by the writer. In the case of one student (F. M. J.) 250 c.c. of urine were secreted in ten minutes, and a similar amount the next ten minutes. The specimens contained no sugar. In Macallum and Benson's experiments they obtained 205 c.c. of urine in ten minutes (approximately 20 c.c. of urine per minute) but the concentration was only about one-eighth of that of the blood (urine $\Delta$ –0.075,

* This portion represents only an abstract of the theories of urine excretion. The author's reprints contain the full text.

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of blood $\Delta$ –0.56). They pointed out (a) that filtration involves essential reabsorption; (b) that the amount of urine would vary with alterations in blood pressure; (c) a certain degree of pressure on the pelvis of one kidney increases the quantity of urine formed as compared with that derived at the same time and at the same blood pressure from the other kidney (compensation force?) and (d) during diuresis reabsorption will be least, on account of the reduced period of contact between the fluid and the tubule. Under these conditions the composition of the blood plasma and urine would be identical. These authors also pointed out that the ratio of potassium to chlorine is never that which obtains in blood plasma. It is usually much greater than that found in the concentrated urine before diuresis was induced. The increase in the value $\frac{K}{CL}$ in dilute urines is due to a "lag" in the diminution of the secretion of the potassium as compared with the chlorine during the period of dilution.

Sufficient clinical evidence of the unreliability of dyes exists in the literature. Assuming that the method involving the use of dyes would yield information *re* excretory function, the latter would not, as usually regarded, represent total kidney activity.

The kidney plays an important part in the regulation of the body neutrality. The blood plasma is slightly alkaline. The urine is definitely acid. The secretion of acid and alkali is not performed uniformly by the whole of a secreting unit. According to Cushny[5] the acidity depends on the presence of salts in the glomerular filtrate. These salts are hydrolyzed and their cations are absorbed while their anions are rejected by the tubular epithelium. Opposed to this theory are (a) Macallum's[22] experiments with his balanced mixture,[11] (b) the results of urinalyses in the case of diabetes insipidus and (c) experimental diuresis quoted above. In the case of diabetes insipidus where large quantities of urine were excreted and the concentration of salts was proportionately low, the pH was still on the acid side. The same conditions were found in experimental diuresis.

There is sufficient experimental evidence demonstrating the specific functions of the various portions of the uriniferous tubules. O'Connor and Conway[30] noted that following the injection of different substances into the circulation their time of appearance in the urine varied. From these observations they concluded that sodium chloride may be excreted either by the tubules or glomeruli; sodium iodide probably by the glomerulus; uric acid by the distal convoluted tubules only, etc. These observations were subsequently corroborated by O'Connor and McGrath[31] by conductivity experiments.

Myer,[18] Jungman and Eckard[7] describe a polyuria due to section of the splanchnic nerves, which are connected with the coeliac ganglion. The writer agrees with Guyon[15] that a voluntary polyuria can be produced by frequent urination and voluntary suppression for a considerable time can be caused by abstaining from passing urine, indicating a certain control.

An attempt will now be made to correlate the above observations with the results obtained in a case of diabetes insipidus and in six normal subjects in whom polyuria was induced. In Table I. are recorded the combined data of the urinalyses in the case of diabetes insipidus including observations on the intake of fluids and the excretion of water, salts and nitrogen. These were obtained from the clinical records of the hospital.* It will be noted that the excretion of fluids was equal and at times greater than the intake. The nitrogen excretion approximated the normal, and was apparently not influenced by the diuresis. The excretion of chlorides, unlike those recorded by previous works, was not increased. Further observations in the same subject by the writer corroborated those recorded in the table.

In Table II. are recorded the combined data obtained by the author in the above case.

*Discussion of results.*—Comparing the above data with the accepted normal findings and considering this case as one of the usual type of diabetes insipidus one is struck by the variation noted. The total solids excreted in twenty-four hours are about half of the amount normally found. Since this phenomenon was accompanied by diuresis it may be explained on the basis of defective secretion. An alternative to this explanation is, that in diabetes insipidus metabolism is decreased, and therefore the products of the latter reaching the kidney are less than the normal. The blood examination in this case however, shows the concentration of urea in the

* The writer is indebted to Dr. W. F. Hamilton for the above data.

TABLE II

STUDIES OF DIABETES INSIPIDUS URINE*

| *Date—April, 1924* | *11* | *13* | *14* | *15* | *29 5 p.m.* | *29 6 p.m.* | *Normal urine* | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | *per cent* | *24 hours* |
| pH | 6.3 | 7.0 | 6.4 | 6.4 | 6.4 | 6.4 | | |
| Specific gravity | 1,002 | 1,002 | 1,004 | 1,003 | 1,003 | 1,003 | 1,010–1,025 | |
| Δ | – 0.16 | – 0.10 | – 0.085 | – 0.092 | – 0.166 | – 0.20 | | |
| Total solids (*a*) | | 0.4512 | 0.2453 | 0.2430 | 0.2631 | 0.2820 | 4.0 | 60.00 gms. |
| Potassium (*a*) | | 0.0087 | 0.0070 | 0.0074 | 0.0210 | 0.0866 | 0.15 | 2.5 |
| Sodium (*a*) | | 0.0261 | 0.0073 | 0.0071 | 0.0030 | 0.0286 | 0.3 | 5.0 |
| Calcium (*b*) | | 0.0035 | 0.0029 | 0.0026 | | 0.0018 | 0.015 | 0.25 |
| Magnesium (*b*) | | 0.0018 | 0.0016 | 0.0012 | | 0.00072 | 0.02 | 0.30 |
| Total chlorides (*b*) | | 0.0640 | 0.0520 | 0.0410 | 0.0725 | 0.0690 | 1.1 | 16.5 |
| Chlorine (*c*) | | 38.85 | 31.56 | 25.49 | 44.00 | 41.88 | | |
| Phosphoric acid (*a*) | | 0.0255 | 0.0302 | 0.0321 | 0.0221 | 0.0241 | 0.15 | 2.5 |
| Sulphur (*a*) | | 0.0115 | 0.0125 | 0.0101 | 0.0130 | 0.01296 | 0.05 | 0.75 |
| Ammonium (*a*) | | 0.0041 | 0.0089 | 0.0041 | 0.0008 | 0.0006 | 0.04 | 0.65 |
| Urea (*a*) | | 0.2980 | 0.2382 | 0.2410 | 0.2330 | 0.2330 | 2.33 | 35.00 |
| Uric acid (*b*) | | 2.12 | 1.63 | 1.70 | 2.68 | 2.72 | 0.05 | 0.75 |
| Total nitrogen (*a*) | | 0.1751 | 0.1312 | 0.1652 | 0.1658 | 0.1750 | 1.0 | 10.0 – 16.0 |
| Intake | | | 9,360 c..c | 8,460 c.c. | | | | |
| Output | | | 9,240 c.c. | 8,400 c.c. | | | | |

(*a*) grms. per 100 grms. of urine.
(*b*) grms. per 100 c.c. " "
(*c*) mg per 100 c.c. " "

* Technical methods: Hydrogen ion concentration by Clark and Lubs (1916). Specific gravity—gravimetric, total solids—by evaporation of urine to constant weight. Sodium and potassium were determined by Macallum's method (1909), calcium and magnesium by McCruden. Chlorides—silver chloride gravimetric. Phosphates by the uranium acetate method. Sulphur was determined as barium sulphate, ammonium and urea by the Van Slyke and Cullen methods. Uric acid by Benedict's (1922), total nitrogen—Kjeldahl's, creatinine by the Weyl, Jaffe and Tiegs methods. Inosite—Gallois and Scherer. Indican—Obermeyer's and the depression of the freezing point by Beckmann's method.

blood was almost three times the normal (0.84 gms. per litre). The sodium, potassium, magnesium and uric acid excreted were decreased. The phosphoric acid, urea and calcium content were normal. Sulphur excretion was increased and creatinine was not detected.

It might here be noted that in experimental diuresis the findings relative to the calcium and magnesium were diametrically opposite to those recorded above. The subjects received no food for twenty-four hours, but 100 c.c. of distilled water at body temperature were administered every hour making a total ingestion of p,400 c.c. of water. The urine was collected every two hours in the course of twenty-four hours. In Table III. are recorded the results of calcium

TABLE III

| | CaO. | $Mg_2P_2O_7$ |
|---|---|---|
| G.C.P. | 0.0195 grms. | 0.1236 grms. |
| G.E.S. | 0.0773 " | 0.2048 " |
| G.E.S.$_1$ | 0.0699 " | 0.5464 " |

and magnesium determinations. This again favours the theory of secretion. The calcium excretion was low and the magnesium high.

The results obtained in a study of the pH of the urine in experimental diuresis also favour secretion. In Table IV. are recorded the data from two subjects. The latter were given large quantities of water and the urine was collected at short intervals (ten and fifteen minutes). It will be noted that in subject F. M. J., during the latter part of the experiment, though the volumes were constant the pH varied.

TABLE IV

| *Name* | *Time* | *Quantity* | *pH* |
|---|---|---|---|
| W. H. G. .... | 9.55 a.m. | 55 c.c. | 5.2 |
| | 10.05 " | 15 " | |
| | 10.20 " | 32 " | 5.4 |
| | 10.35 " | 108 " | 5.7 |
| | 10.50 " | 178 " | 5.6 |
| | 11.00 " | 200 " | 5.7 |
| | 11.10 " | 127 " | 5.6 |
| F. M. J .... | 10.20 " | 65 " | 5.6 |
| | 10.30 " | 85 " | 5.7 |
| | 10.40 " | 172 " | 5.9 |
| | 10.50 " | 230 " | 6.1 |
| | 11.40 " | 144 " | 6.1 |
| | 11.50 " | 150 " | 5.9 |
| | 12.00 " | 150 " | 6.0 |

By studying the influence of the pituitary gland on the function of the kidneys further

proof of secretion is afforded. Rabinowitch[33] showed that the extract of the posterior lobe of the pituitary gland is effective in controlling polyuria in diabetes insipidus. Rees and Olmsted[34] and Hamilton[14] subsequently corroborated this view. The latter author administered the effective agent through the nasal mucous membrane. The above observations exclude the possibility of the kidney being the primary cause of the polyuria in diabetes insipidus.

A contributing extra renal factor for the polyuria in the subject studied may have been the increase in pulse pressure, which may be attributed to an increase in the water content of the blood. Thus on three days the systolic, diastolic and pulse pressure were as follows:

TABLE V

Mar. 18, 1924, systolic 156, diastolic 76, pulse pressure 80
Mar. 19, 1924, systolic 140, diastolic 95, pulse pressure 45
Mar. 24, 1924, systolic 130, diastolic 70, pulse pressure 60

*Summary*

In the study of a case of diabetes insipidus and polyuria experimentally induced in normal individuals, an attempt was made to determine the nature of the polyuria and correlate the results and explain them on the basis of the various theories of renal function.

The consensus of opinion appears to be that the polyuria in diabetes insipidus is due primarily to the action of the pituitary gland on the kidney. The results of the writer's experimental work favour this view. This is particularly suggested by the comparative study of the chemical composition of the urine in diabetes insipidus and of the normal subjects in whom polyuria was experimentally induced.

Observations made in this investigation favour the view of the secretion theory.

The fact that in spite of enormous quantities of fluid (10,000-15,000 c.c. in 24 hrs.) excreted over a short period, there is a marked difference not only in composition but also in reaction between blood and urine, favours activity of the renal cell rather than simple filtration.

The absence of sugar in the urine during polyuria even in most minute quantities is rather opposed to simple filtration.

The specificity of function of the various renal units, for example acid secretion by the proximal convoluted tubules, also favours secretion.

There is no evidence clinically or from microscopic urinalyses suggesting that the polyuria of diabetes insipidus might be due to anatomical changes in the kidney.

In conclusion, the author wishes to thank Professor A. B. Macallum for his many suggestions, direction of the effort and constant aid and encouragement in carrying out this work.

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# THE SIGNIFICANCE OF GENITO-URINARY PAIN*

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EVERY part of the urinary and genital tracts produces pain of a varying degree under certain abnormal conditions. In discussing the subject, I want to consider the types of pain which originate in the kidney, ureter, bladder, urethra, prostate, seminal vesicles, vas deferens and epididymis.

*Kidney.*—Pain originating in the kidney comes mainly from distension, the presence of a foreign body or the two conditions combined. Renal colic occurs when the kidney makes an effort to throw off some foreign body, *viz.*, a calculus, caseous material or a blood clot. A typical renal colic originates in the costo-muscular angle of the side affected, and radiates through to the front. It may follow the course of the ureter for a few inches but usually stops in the abdomen a short distance below the lower costal cartilages. The character of the pain varies greatly. It may come on suddenly either while at rest or moving about, grip very tightly in the flank, be excruciating in character and cause the patient to bring the body and knees together while he rolls about in an intense agony. In these days of motor cars, one who is harbouring a stone in his kidney may have a colic come on while riding over a rough road. From the severe agonizing type of kidney colic we see types decreasing in severity until a slight dull ache is the only pain present. Ureteral pain, in contrast to kidney pain, follows the course of the ureter and radiates to the external genitalia accompanied by nausea and often vomiting.

A *movable kidney* will give pain when the uretero-pelvic junction has become blocked and the pelvis distended. The location of the pain varies according to the position of the kidney, may be dull or sharp in character, present over the position of the kidney in the flank or lower iliac fossa of that side. A floating kidney commonly occurs on the right side and is part of a visceroptosis. Hydronephrosis causes a dull pain in the flank increasing in severity while the kidney is filling with urine. This radiates through to the front but not down the ureter unless the obstruction be low in the ureter when the distension will cause a dull or sharp pain along the course of the ureter. Relief of the obstruction is followed by the disappearance of the pain and the passage of a large quantity of urine. If a dilatation of the kidney pelvis or ureter has been present over a long period of time, these parts may have assumed a larger size and no pain be caused by their dilatation.

*Renal tuberculosis* commonly does not cause pain in the kidney affected. In a few instances there may be a dull pain referred to that side together with some tenderness in the costo-muscular angle. Some have tenderness in the costo-muscular angle but no pain. Then, if a piece of caseous material in the kidney should break away *en masse* and start down the ureter, it would occasion typical kidney and ureteral colic.

*Inflammation* in the kidney usually gives a dull ache in the flank, pain and tenderness in the costo-muscular angle and a palpable kidney, if it is enlarged. A great many profound inflammations in the kidney may cause high fever continued over many days and not give pain or any localizing symptoms. Neoplasms in the kidney cause a dull pain in the flank in a small percentage. Occasionally the growth is so situated as to cause an intermittent obstruction to the ureter; the pain is then the same as that arising from hydronephrosis. Pain due to trauma may be very severe. Rupture of the kidney is indicated by a swelling in the flank, tenderness in the costo-vertebral angle and hæmaturia.

*Pregnant women* frequently develop pain in one or both flanks. This pain may be very severe in character and radiate from the region of the costo-muscular angle to the front and

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down toward the iliac fossa. Considerable tenderness and rigidity is usually present in the flank and pus is found in the urine. This is due to a pyelonephritis caused by a dilatation of the pelvis and ureter secondary to an obstruction at the lower end of the ureter.

*Ureter.*—Ureteral pain is distributed along the course of the ureter and may radiate to the external genitalia and inner thigh of the side involved. Ureteral colic is very severe in character, doubling the patient up and causing intense agony. It is accompanied by nausea and frequently by vomiting. Often the gastro-intestinal symptoms of distension, nausea and vomiting accompany this pain, and confront the physician with the problem of differentiating between an intestinal obstruction and an ureteral obstruction. Foreign bodies such as calculi, blood clots or caseous material passing down the ureter are the chief causes of ureteral colic.

*Bladder.*—Pain originating in the bladder may show itself suprapubically, in the perineum or toward the end of the urethra. Acute dilatation of the bladder as it occurs in retention of urine, gives, at first, a dull pain low in the midline of the abdomen, which later, becomes quite sharp as the bladder becomes over-distended. An acutely inflamed bladder mucosa produces an intense pain when the bladder is full and also a sharp pain referred along the urethra at the end of urination. It is difficult to separate the pain of a posterior urethritis from an inflammation of the bladder trigone. In both conditions there is a sharp burning pain in the perineum present continuously and aggravated by the passage of urine. When the bladder contracts on a foreign body such as a calculus, a tumour, or its own acutely inflamed mucosa, a sharp pain is referred to the end of the urethra and is often accompanied by some terminal hæmaturia.

*Prostate.*—Prostatic pains are referred to the sacrum, to the suprapubic area immediately over the symphysis pubis, to the perineum and to the urethra one inch back of the meatus. The pain over the sacrum is a dull ache which may be simply annoying to the patient, or is so severe as to cause considerable disability. The pain in the urethra one inch back of the meatus may be burning in character and be present continuously, suggesting what the patient describes as a "raw ulcer." A few prostatic massages relieve it.

*Seminal vesicles.*—These give a dull or sharp pain referred to the inner half of the area immediately above Poupart's ligament. These pains may be sharp and referred up the flank to the region of the kidney and suggest a definite renal colic. In these cases the only pathological condition which may be found is an inflammation of the seminal vesicles and prostate, determined by the presence of pus in the secretion.

*Epididymis and vas deferens.*—Patients who develop an epididymitis have some pain and tenderness in the vas. This may be severe in character and be present in the inguinal canal. Considerable tenderness over the vas deferens can be traced deep into the lower abdomen following the vas in its descent into the pelvis. This lower abdominal pain has been responsible for the removal of the appendix of patients in whom an acute urethritis had not been suspected.

*Other symptoms which accompany pain.*—Lesions in the kidney, ureter and bladder which produce varying types of pain are accompanied by one or more of the common urinary symptoms. Frequency of micturition is the common one to accompany urinary pain. Hæmaturia may accompany a ureteral colic but more commonly microscopic blood is found in the centrifuged specimen of urine. Nausea, vomiting and abdominal distension frequently accompany severe ureteral pain. The retention of infected urine in the kidney as found in pyonephrosis with temporary blockage of the ureter will give chills, fever, nausea and vomiting.

### *Summary*

1. Pain in the flank accompanied by tenderness in the costo-muscular angle is indicative of kidney trouble.

2. Pain radiating along the course of the ureter suggests an obstruction, or a foreign body passing down the ureter.

3. Suprapubic pain accompanied by difficulty or frequency of urination is due to the bladder.

4. Pain referred to the end of the penis, perineum or over the sacrum is frequently caused by trouble in the bladder trigone or prostate.

5. Pain over the vas deferens in the inguinal canal suggests inflammation in this structure and in the seminal vesicles. Seminal vesicle pain may simulate a ureteral colic and be referred up the course of the ureter.

6. The presence of pus or blood in the urine will be of great assistance in localizing the cause of the pain to the urinary tract. Their absence will not exclude the genito-urinary tract as a cause for the pain being investigated.

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# AN ANALYSIS OF 150 DEATHS FROM DIPHTHERIA*

By Beverley Hannah, M.B. (Tor.), and L. M. Murray, B.A., M.B. (Tor.)

*Toronto*

AN analysis of any disease may be sought, first, in individual experience; secondly, in the records of hospital; and, thirdly, in the statistics of the Department of Public Health. Hospital records offer the best source for such information. Conditions ensure a more correct diagnosis, a greater uniformity of environment, and a more detailed record than is possible elsewhere. Any attempt to draw deductions from hospital records as to the normal incidence in the population of mortality rate, is an obviously fallacious procedure. The hospital population is a highly adversely selected sample of the general population.

This analysis of deaths from diphtheria was undertaken for the purpose of ascertaining if there was any specific reason for the rise in mortality rate of this disease during the past year, at the Riverdale Isolation Hospital, Toronto.

Case incidence has remained about stationary during recent years. There is a noticeable rise in the mortality rate for the year 1925 and the early part of 1926, compared with the three preceding years in the hospital. An average of 8.13 per cent would tend to indicate that the death rate of diphtheria is not on the decline.

TABLE I

Incidence and Percent Mortality—Diphtheria
Riverdale Isolation Hospital, Toronto

| *Year* | *Cases* | *Deaths* | *Percent Mortality* |
|---|---|---|---|
| 1922..... | 730 | 43 | 5.9 |
| 1923..... | 463 | 34 | 7.3 |
| 1924..... | 334 | 26 | 7.8 |
| 1925..... | 340 | 43 | 12.6 |
| 1926 (5 months). | 148 | 18 | 12.1 |
| Total..... | 2,015 | 164 | 8.13 |

Deaths within twenty-four hours of admission—35.2%
Deaths within forty-eight hours of admission—46.1%

TABLE NO. II

Diphtheria Deaths
Riverdale Isolation Hospital, Toronto, 1922–1926

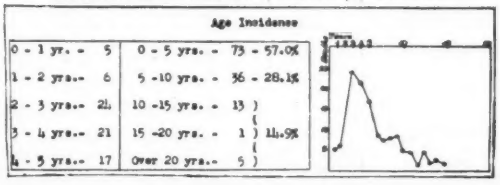
*Sex Incidence*

| *Year* | *Male* | *Female* | *Total* |
|---|---|---|---|
| 1922..... | 24% | 76% | 43 |
| 1923..... | 44% | 56% | 34 |
| 1924..... | 46% | 54% | 26 |
| 1925..... | 48% | 52% | 43 |
| 1926..... | 55.5% | 44.5% | 18 |

Sex incidence does not appear to influence diphtheria death rate to any appreciable extent.

TABLE NO. IIIA

Diphtheria Deaths
Riverdale Isolation Hospital, Toronto




* Read before the Canadian Society for the Study of Diseases of Children, Gananoque, June, 1926.

TABLE NO. III
RIVERDALE ISOLATION HOSPITAL

*Age Incidence*

| *Age Group* | *Number of Deaths Yearly* | | |
|---|---|---|---|
| | *1923* | *1924* | *1925* |
| 0– 1 year | .. | 2 | 1 |
| 1 –2 years | 1 | 3 | 2 |
| 2– 3 years | 6 | 5 | 5 |
| 3– 4 years | 5 | 6 | 7 |
| 4– 5 years | 5 | 4 | 6 |
| 0– 5 years | 17 | 20 | 21 |
| 5–10 years | 10 | 5 | 15 |
| 10–15 years | 3 | 1 | 5 |
| 15–20 years | 1 | .. | .. |
| Over 20 years | 3 | .. | 2 |
| Total | 34 | 26 | 43 |

Age greatly influences the diphtheria mortality. It is an established fact that infants under six months are especially immune to this disease. The highest death rate occurs during the first five years of life, especially the age-period of two to five years; the period five to ten years ranks next. A diminution immediately takes place after this period. In adult life, the death rate is almost insignificant. It is the age-period two to ten years where the high fatality in diphtheria manifests itself. The importance of this fact is emphasized when it is realized that this age period corresponds with the pre-school and early school periods of life.

Authors are not agreed that climatic conditions have any definite association with the type of diphtheritic epidemics. A reduction in case-incidence and mortality occurs during the dry seasons. Cold and wet years or months bring epidemics of diphtheria. The second and third quarters of the year exhibit a decline in the case-incidence with a stationary or slight fall in the death rate. The fourth and early part of the first quarter show a marked addition in the case-incidence and rise in the number of fatal attacks.

A consideration of the site and type of diphtheria shows that a majority of the deaths occurred in cases which had their primary lesion in the fauces. From this site, the infection spreads rapidly to the pharynx, larynx and nose. Out of 103 deaths, seventy-eight or

TABLE NO. IV
MONTHLY CASE INCIDENCE AND MORTALITY
DIPHTHERIA
RIVERDALE ISOLATION HOSPITAL, TORONTO

| *Month* | *Cases* | *Deaths* | *Percent Mortality* |
|---|---|---|---|
| January | 195 | 14 | 7.1 |
| February | 135 | 10 | 7.4 |
| March | 186 | 9 | 4.8 |
| April | 139 | 12 | 8.6 |
| May | 166 | 13 | 7.8 |
| June | 114 | 13 | 11.4 |
| July | 133 | 11 | 8.3 |
| August | 127 | 10 | 7.9 |
| September | 124 | 10 | 8.0 |
| October | 179 | 15 | 8.4 |
| November | 185 | 8 | 4.3 |
| December | 184 | 21 | 11.4 |
| Total | 1,867 | 146 | 7.8 |

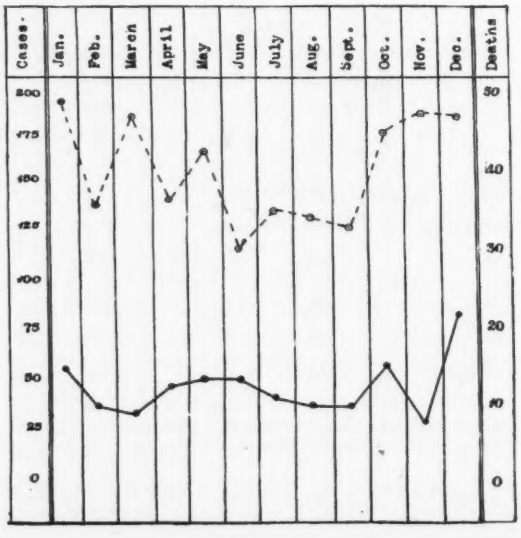


TABLE NO. V

DIPHTHERIA DEATHS
RIVERDALE ISOLATION HOSPITAL, TORONTO

| *Site of Infection* | *Deaths* | *Percent of Total Deaths* |
|---|---|---|
| Nasal, alone | .. | .... |
| Faucial, alone | 17 | 16.5 |
| Nasal and faucial | 13 | 12.6 |
| Faucial and pharyngeal | 15 | 14.4 |
| Nasal, pharyngeal and faucial | 36 | 34.9 |
| Nasal and laryngeal | 4 | 3.9 |
| Faucial and laryngeal | 9 | 8.7 |
| Nasal, pharyngeal, faucial and laryngeal | 7 | 6.8 |
| Total laryngeal | 21 | 20.3 |
| *Type of Infection* | | |
| Simple | 78 | 75.8% |
| Malignant (hæmorrhagic) | 25 | 24.2% |

75.8 per cent were of the simple type, and twenty-five or 24.2 per cent were classified as malignant or hæmorrhagic. Death occurred in every case of diphtheria where there were hæmorrhages into the subcutaneous tissues and continuous uncontrollable oozing from the mucous membranes of the nasal chambers, throat or gums.

Much importance has been attached to diphtheria of the larynx and trachea. In an analysis of 224 cases of laryngeal diphtheria, it was found that there was a mortality of fifty-four or 22.1 per cent. In 164 deaths from diphtheria this represents 32.9 per cent of the total deaths. Ninety per cent of the 224 cases of laryngeal diphtheria were secondary to a primary lesion elsewhere, usually the fauces. Fifty of the fifty-four deaths occurred in the secondary laryngeal diphtheritic group. These facts demonstrate that early diagnosis of the primary lesion and administration of antitoxin which were wanting in almost every case, would prevent the occurrence of secondary laryngeal diphtheria, and bring about a definite reduction in death rate from diphtheria.

It will be found in Table No. 8 that a high percentage of the deaths occurred within the first four to seven days after cases were admitted to hospital. This is especially noticeable in the first twenty-four to forty-eight hours following admission. This would indicate that many of the cases are in a serious, often moribund condition at the time they are brought to hospital.

Table No. 9 illustrates the delay by the public in seeking the services of a competent medical

TABLE NO. VI

LARYNGEAL DIPHTHERIA
RIVERDALE ISOLATION HOSPITAL, TORONTO

| | | | |
|---|---|---|---|
| Admissions | 224 | Total deaths from diphtheria | 164 |
| Deaths | 54 | Total deaths from laryngeal diphtheria | 54 |
| Percent mortality | 22.1 | Percent of total deaths | 32.9 |

| | | | |
|---|---|---|---|
| Deaths from laryngeal diphtheria | 54 | Primary laryngeal diphtheria | 24 cases—10% |
| Deaths within twenty-four hours of admission | 27 | Recovered | 20—83% |
| Deaths complicated by pneumonia | 11 | Died | 4—17% |
| Deaths with associated hæmorrhagic diphtheria | 3 | Secondary laryngeal diphtheria | 220 cases—90% |
| | | Recovered | 170—77% |
| | | Died | 50—23% |

| | | |
|---|---|---|
| Tracheotomy performed in | 1 case | 1 death |
| Intubation performed in | 85 cases | 24 deaths |
| Intubation performed in | 159 cases | 30 deaths |

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TABLE NO. VII

LARYNGEAL DIPHTHERIA

RIVERDALE ISOLATION HOSPITAL

*Mortality in Age Groups*

| *Age Group* | *Cases* | *Deaths* | *Percent Mortality* |
|---|---|---|---|
| 0– 1 year..... | 17 | 5 | 29.6 |
| 1– 2 years..... | 49 | 11 | 22.3 |
| 2– 3 years..... | 38 | 7 | 18.4 |
| 3– 4 years..... | 29 | 8 | 27.6 |
| 4– 5 years..... | 20 | 4 | 20.0 |
| 0– 5 years..... | 153 | 35 | 22.8 |
| 5–10 years..... | 53 | 9 | 17.0 |
| 10–15 years..... | 3 | 1 | |
| 15–20 years..... | 3 | 1 | |
| Over 20 years... | 10 | 4 | |

TABLE NO. VIII

DIPHTHERIA DEATHS

RIVERDALE ISOLATION HOSPITAL

*Duration of Illness in Hospital*

| *Days* | *Deaths* | *Total Deaths* | *Percent of Total Deaths* | |
|---|---|---|---|---|
| 1 | 45 | 45 | 35.2 | 35.2 |
| 2 | 14 | 59 | 10.9 | 46.1 |
| 3 | 14 | 73 | 10.9 | 57.0 |
| 4 | 11 | 84 | 8.6 | 65.6 |
| 5 | 10 | 94 | 7.9 | 73.5 |
| 6 | 5 | 99 | 3.9 | 77.4 |
| 7 | 5 | 104 | 3.9 | 81.3 |
| 7 plus | 24 | 128 | 10.9 | 100.0 |

man. This is one of the most important factors in maintaining the present death rate from diphtheria.

One of the most important factors in maintaining the present day high mortality rate of diphtheria is illustrated in Table No. 10. Delay in the administration of antitoxin may be due to either the physician or the patient. In many instances the medical man postpones the early administration of antitoxin whilst waiting for the laboratory report of nose and throat cultures.

Clinical records made on cases of diphtheria admitted to Riverdale Isolation Hospital led us to believe that probably the type of

TABLE NO. IX

DIPHTHERIA

RIVERDALE ISOLATION HOSPITAL, TORONTO

Duration of Illness before 1st. visit of Physician

| Days | Admissions Recovered | Died | Total | Percent Mortality | Percent Mortality |
|---|---|---|---|---|---|
| 1 | 119 | 11 | 130 | 8.4 | |
| 2 | 395 | 28 | 423 | 6.6 | |
| 3 | 252 | 33 | 285 | 11.6 | |
| 4 | 135 | 24 | 159 | 15.1 | |
| 5 | 72 | 18 | 90 | 20.0 | |
| 6 | 26 | 5 | 31 | 19.0 | |
| 7 | 3 | 3 | 6 | 50.0 | |
| 7 plus | 7 | 3 | 10 | 30.0 | |

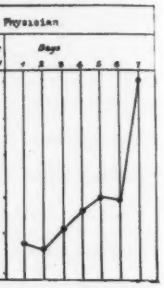


TABLE NO. X

DIPHTHERIA

RIVERDALE ISOLATION HOSPITAL, TORONTO

Duration of Illness before Administration of Antitoxin

| Days | Admissions Recovered | Died | Total | Percent Mortality | Percent Mortality |
|---|---|---|---|---|---|
| 1 | 56 | 2 | 58 | 3.5 | |
| 2 | 264 | 13 | 277 | 4.7 | |
| 3 | 296 | 39 | 335 | 11.6 | |
| 4 | 205 | 34 | 239 | 14.2 | |
| 5 | 101 | 19 | 120 | 15.8 | |
| 6 | 56 | 6 | 62 | 9.7 | |
| 7 | 17 | 5 | 22 | 22.8 | |
| 8 | 18 | 4 | 22 | 18.2 | |

diphtheria was unusually severe and more rapid in its progress during the last year, compared with former years. The laboratory was unable to demonstrate any variability in the degree of virulency of the Klebs Loeffler bacillus. Investigators have shown that the amount of antitoxic units in the body tissues, normally present, varies in different individuals. These observations are suggested as possible additional factors in the recent increased mortality rate of diphtheria in the hospital.

Death in diphtheria results from heart failure. There is some degree of damage to the myocardium in every case of this disease. The diphtheritic heart is a primary toxic parenchymatous degeneration, most frequently of a hyalin nature. Where recovery takes place, a reparative inflammation with muscle regeneration occurs. Practically all the deaths occurred within three weeks from the onset of the illness and were due to myocardial degeneration. The post-diphtheritic paralyses do not appear to have had a part in causing death during the first three weeks. It is after the third week, during convalescence, that the more serious nerve lesions manifest themselves.

and are an important factor in bringing about a fatal ending. Other complications of diphtheria seldom endanger the life of a patient, except pneumonia which may follow the laryngeal infection.

This analysis shows that the hospital death rate from diphtheria has remained stationary, but for a definite increase during the last year. From this investigation we have demonstrated that the death rate from diphtheria in the hospital is too high; that this condition is not due to hospital treatment but rather to certain definite circumstances arising outside the institution. A marked reduction in hospital and general mortality rate from diphtheria is possible.

The following procedures must become part of a general campaign:

1. Education of the public that a sick child or sore throat in any individual demands immediate medical services.

2. Education of the medical profession to read a clinical picture and not thrust the burden of diagnosis on the laboratory.

3. Early administration of antitoxin in large dosage, to all cases which are clinically diphtheria.

4. Active immunization, especially of the pre-school child. This must become an accepted procedure with the medical profession and general population.

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# THE TREATMENT AND CAUSES OF CONVULSIONS IN INFANTS AND CHILDREN*

By Gordon Chown, B.A., M.D.,

*Attending Physician, Children's Hospital, Winnipeg, Demonstrator in Pædiatrics, University of Manitoba*

IT is not necessary to describe a typical convulsion, as every physician is familiar with it. The minor forms, which the mother usually refers to as "screaming convulsions", "inward convulsions", etc., should receive serious consideration, as they may be the first sign of coming danger in the form that is now recognized as the laryngismus stridulus or tetany, or the *petit mal* of epilepsy. At the outset it must be recognized that a convulsion, or a series of convulsions, is merely a symptom, but one which requires active treatment, as much to reassure the parent as to relieve the child.

*The immediate treatment of convulsions.*—For the average convulsion, the patient, if his temperature is not elevated, should be at once undressed and placed in a mustard bath at a temperature of 105° brisk friction being applied to the trunk and extremities. Where hyperpyrexia is associated with the convulsion a cold bath or pack should be substituted, and at the same time a high rectal irrigation should be given. As soon as the patient is conscious two teaspoonfuls of castor oil should be administered. In case the attack is a very severe one, and the child is slow to respond, or passes rapidly from one convulsion to another, chloroform should be given in sufficient quantity to check the seizures. Meanwhile, the intestinal canal should be emptied, and sufficient sodium bromide and chloral given in one or two ounces of warm milk, high up in the rectum to check recurrence. The average dose for infants under one year of age is eight grains of sodium bromide and three grains of chloral hydrate; for older children ten to twenty grains of sodium bromide and five grains of chloral hydrate. As long as there is any sign of nervous irritability, such as twitchings or involuntary muscular contractions, this may be repeated, at intervals of two to six hours, and continued in diminished doses. In cases where chloral and bromide fail to

* Read before the annual meeting of the Canadian Medical Association, Victoria, B.C., June, 1926.

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control the convulsions, morphine may be given hypodermically in doses of 1/40 grain to infants six months of age and under; 1/20 grain for one year of age; and 1/10 grain for two years of age. For frequently recurring convulsions magnesium sulphate, subcutaneously, is effective in doses of 8 to 10 grains, for the average infant of three or four months; 15 to 20 grains to one of six months. If necessary, this may be repeated in two hours. Oxygen is indicated in convulsions due to asphyxia.

The therapeutic value of lumbar puncture for recurring convulsions over a period of many hours is doubtful, but it is of value for purposes of diagnosis.

*After care.*—Put the child in a quiet, darkened room, with an ice cap to head; give a liquid diet, with a liberal quantity of orange juice, or ten per cent glucose solution. A detailed history should be taken and a careful examination made, to ascertain the cause.

*The causes.*—Etiologically, convulsions may be classed under five heads: (1) metabolic or chemical; (2) idiopathic; (3) toxic; (4) organic, and (5) reflex.

*1. Metabolic or chemical.*—The majority of convulsions of infancy, occurring a few months after birth, come under this heading. They are known clinically as tetany or spasmophilic convulsions. The usual age incidence is between six and eighteen months; most commonly, between six and ten months. Several clinical conditions, formerly described as separate entities, are now regarded as manifestations of tetany, *e.g.*, convulsions, laryngismus stridulus or laryngospasm, carpopedal spasm, and breath-holding spells. The metabolic etiological factor is apparently a lack of balance between the irritating sodium, potassium and hydroxyl ions on the one hand, and the sedative calcium, magnesium and hydrogen ions on the other. In infantile tetany the gross chemical finding is a lowering of the blood calcium, but the resultant nervous hyperirritability may be controlled by increasing any one of the three sedative ions, calcium, magnesium or hydrogen, thus readjusting the balance. The factor that seems to lie directly behind this chemical imbalance is apparently an improper functioning of the parathyroid glands, and behind this again usually a vitamine deficiency. Infantile tetany is almost always associated with a mild or a severe degree of rickets, which is now recognized as a metabolic disease due to deficiency of the antirachitic factor. This latter is contained in large quantity in biologically tested cod liver oil, and may be produced by the rays of the mercury quartz lamp.

It has long been recognized that symptoms of active tetany are found from January to May, more particularly in March and April. Dr. A. T. Cameron,[1] Professor of Biochemistry, University of Manitoba, has recently brought forward experimental evidence as to the seasonal incidence of tetany. He has shown that the symptoms may be induced by a fall of barometric pressure, increase in air temperature and increase in water vapor pressure. This results in a lowering of the oxygen content of the respired air. To meet this the respirations increase, more $CO_2$ than normal is driven off, and a condition of relative alkalosis sets in. The chemical balance is altered, and active tetany results. Professor Cameron has been able to produce this series of phenomena at will in white rats. If correct, this theory, therefore, explains the tetany months, since in the thaw of spring these sudden atmospheric changes are most likely to occur together.

Tetany is comparatively rare in the breast-fed baby, and in infants who have received proper amounts of biologically tested cod liver oil. In the artificially fed baby it becomes increasingly more common as the baby is fed raw cows' milk, boiled cows' milk, or patent baby food, especially when associated with poor hygienic surroundings and lack of sunlight.

The early symptoms, such as child-crowing, breath-holding spells and carpo-pedal spasm are frequently overlooked. The peculiar inspiratory crow, technically called laryngismus stridulus, or laryngospasm, has, in my experience, often led to the erroneous diagnosis of whooping-cough, or croup. The convulsions of tetany are not distinctive from convulsions due to other causes. There may be a single convulsion, or as many as twenty to thirty a day. If they occur in the months of January to May, and are associated with a normal temperature, a level anterior fontanelle and signs of rickets, one should look for confirmatory signs of tetany both clinically and with the help of the laboratory.

*Clinical* (a) *Chvostek's and allied signs.*—Chvostek's sign is elicited by tapping over a branch of the facial nerve with a percussion

hammer. It is positive when the muscles respond by a twitch. The reaction is clear cut and is almost invariably present in tetany, but it is not significant after two years of age. The allied signs are the peroneal and quadriceps reflexes. The former is elicited by tapping over the peroneal nerve as it passes around the head of the fibula; and the latter by tapping over the centre of the quadriceps femoris. In each case the sign is considered positive when the corresponding muscle group twitches. These signs must be sought for with the infant at rest. (b) *Trousseau's sign.* This sign is elicited by constricting the upper arm with a tourniquet for two to three minutes. It is said to be positive when such constriction produces carpal spasm in the hand of that arm. This sign is pathognomonic when present, but it is frequently absent even in marked cases.

*Laboratory.* (a) *Erb's sign.* — This is the demonstration of quantitative changes in the reaction of the nerves to the galvanic current. It is not usually available except in hospital practice, and then it is only of value if the determinations are made by an experienced person. It is only necessary for diagnosis in doubtful cases. (b) *Blood calcium.* Normally the blood calcium level in infancy is 10 to 11 mgm. per 100 c.c. of serum. In tetany it is practically always lowered, being usually below 7 mgm., and is often down to 5 mgm.

Symptomatic treatment for the convulsions has already been outlined. As the convulsions are the result of a low blood calcium content, 15 grains of calcium chloride should be given four to five times daily for two days; the dose should be reduced then to three times daily, and continued for three weeks. The calcium chloride may be dissolved in a little water and placed in the feedings. Biologically tested cod liver oil should be given three times daily, in drachm doses, over a long period of time. If possible, the infant should be exposed to the direct rays of the sun for gradually lengthening periods. In the winter months the quartz lamp has a definitely curative value.

*Case 1.*—Baby G., aged thirteen months, seen on January 20, 1926, in Winnipeg. The child had been breast-fed for eight months. The family of four lived in a rooming house, in a poorly ventilated, badly lighted room; an environment where one is most likely to find rickets and tetany. The child had had vomiting and diarrhœa for two weeks, choking and gasping spells for ten days, and had developed an unnatural position of the hands and feet (carpo-pedal spasm) for one week. Physical examination revealed marked evidence of rickets, a clearly positive Chvostek, marked carpo-pedal spasm, and, in crying, the laryngo-spasm or tetany crow. The patient was referred to the Children's Hospital. On admission weight was seventeen pounds, eleven ounces; the blood calcium was 6.6 mgm. per 100 c.c. One c.c. of Collip's serum was administered; six hours later and before the next feeding, the blood calcium was 6.74 mgm. per 100 c.c. On January 23rd 1 c.c. of Collip's serum was injected; and the following day the blood calcium was 7.2 mgm. per 100 c.c. As there was no change in the clinical picture the routine treatment with calcium chloride was ordered, and within forty-eight hours the hands and feet became relaxed, and remained so.

At this time there was no information available as to dosage of Collip's serum, and the doses used in my case were those recommended by Professor Cameron, who had been doing experimental animal work. Recently Hoag[2] has worked out the dosage of this serum, with which one can get definite results.

In 1924 Hugh Joseph with S. G. Ross reported a case of a child who suffered convulsions, accompanied by vomiting, and, in one instance, a very marked lowering of the blood sugar, at the onset of an acute infection. After further observations[3] on a series of ten cases Ross noted that certain children have convulsions in the early morning, after a short fasting period of ten to twelve hours. In three cases the blood sugar was estimated immediately following the convulsion and found to be markedly lowered. He suggested that short periods of fasting may be a cause of convulsions in children, especially that type of convulsion which is seen at the onset of acute infections, and that these convulsions are hypoglycæmic in origin. In the cases reported glucose solution, by mouth or rectum, was given in small quantities and were frequently repeated.

*II. Idiopathic-Epilepsy.*—One must distinguish clearly between the so-called idiopathic epilepsy and epileptiform convulsions due to gross intracranial disease. Boyer[4] states that we must have some idea of what constitutes the epileptic convulsive case, or we will be in danger of confusing all convulsions with this condition. His definition is as follows, "A seizure to be epileptiform must be transient, must impair or cause loss of consciousness, and must ultimately result in some change, however slight, in the personality or in the mentality of the patient." This definition is applicable to attacks of *grand mal* (with convulsions), and to attacks of *petit mal*, with

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such symptoms as a sudden look of blankness, a momentary loss of consciousness, the dropping of some utensil, a fleeting stop in the performance of some action, in speech or in attention, and the involuntary passage of a few drops of urine. In the history of such cases one should search the family record for other epileptics or for evidences of familial neuropathy. Age is an important point in diagnosis and in prognosis. The age incidence in 142 cases of idiopathic epilepsy in children studied by Boyer is as follows; convulsions previous to two years of age, forty-one cases (this includes three or four undoubted infantile cerebral traumata at birth); from two to five years of age, thirty-three cases; from five to ten years of age, fifty cases; and from ten to fifteen years of age, eighteen cases. One should always guard against a positive diagnosis of epilepsy in children having had one convulsion, a series of convulsions, or in cases with evidence of *petit mal;* for children, with their rapid growth and development have a wonderful tendency to "outgrow" many conditions, and this factor must always be considered in convulsive disorders.

If the convulsions are not associated with demonstrable physical findings, such as tetany, high temperature due to indiscretions in diet, or to the onset of an acute infection, the patient should be referred to hospital for a complete laboratory and clinical investigation, to exclude any evidence of organic or cerebral disease, or sources of reflex irritation. Such investigation should include a blood and spinal fluid Wassermann; blood sugar estimation; and examination of fundi, tonsils, teeth, sinuses; a urinalysis; a search of the stools for parasites and ova; a bismuth series should also be taken with reference to intestinal stasis. More often than not negative findings will be the result, but if there are one or more positive findings treatment as indicated should be followed; for though a cure may not follow, at least the number of attacks may be lessened, and the mental deterioration, which accompanies epilepsy, may at least be delayed considerably.

The relation of convulsions in infancy to subsequent true epilepsy has been investigated recently, but my impression, from a review of the literature, is that the percentage is either low or high, 7 per cent to 22 per cent, depending upon whether the investigator is a pædiatrician or a neurologist. From Boyer's statistics it will be noted that the greatest number of cases occurred in the age period of from five to ten years. It is the time when children are beginning school, and in school, competition at once becomes the dominant force. Children of a neuropathic tendency may react, owing to the cumulative effort and worry, by a convulsion but not necessarily at once. The child who has once had a convulsion, without demonstrable physical findings, should be put on a definite daily routine at once. School should be prohibited, and if conditions are suitable, individual instruction, limited as to time, should be given. The child should sleep twelve to fourteen hours at night, depending upon its age, and should rest one and a half to two hours in the afternoon. Care should be taken to avoid all excitement and mental strain, such as is produced by competitive games, picture shows, etc. All foci of infection should be removed and any defects found should be corrected.

An anti-constipation diet should be ordered. Recently Peterman,[5] in a preliminary report, advocated a ketogenic diet, largely because many have noted that anæsthesia with chloroform or ether, due to the temporary acidosis produced, suppresses epileptic attacks for a considerable period. In practice it amounts to feeding not more than 15 grammes of carbohydrate, in some cases less than 10 grammes, daily, and not over 1 gramme of protein for each kilogram of body weight, but with enough fat to make up the required calories. Our experience with this diet, at the Children's Hospital, during the past eighteen months, has been limited to eight cases. In every instance it was noted that diacetic acid and acetone were present in the urine after an interval of three days, and this condition was maintained while in hospital. Previous to discharge the parents were instructed in the preparation of the diet; and subsequently it was possible for the nutrition worker of the hospital to follow up four cases residing in the city. In spite of careful and constant instructions in reference to the importance of maintaining this diet, repeated urinalyses after discharge failed to show the presence of acetone in the urine. The difficulty with this diet is its very high fat content, which tends to lessen the appetite, and the low amount of carbohydrates. Unless the child is very carefully supervised, he will steal

sugar and sweets, thereby upsetting the balance of the diet.

Vegetable catharties or liquid paraffin should be given in sufficient quantity to avoid constipation. Bromides, sodium, potassium or strontium, alone or combined, are of great benefit. If the attacks usually occur during the night a single dose of 5 to 10 grains at bed time, for a child from four to ten years of age, is sufficient. In diurnal attacks give repeated doses of the same amount, or, if necessary, even larger doses, and these should be given before meals. A five-year old child may receive 2 to 4 grammes of bromides a day; a ten-year old child from 4 to 6 grammes. If an acniform rash occurs during the course of the bromides they must be discontinued. In certain cases, where bromides fail, luminal, in doses of 2/3 or 3/4 of a grain, may be given, preferably at night, to a child of five years of age. As soon as the patient is under control an effort should be made to reduce the dosage.

*III. Toxic.*—Here we are using the term toxic in a wide sense, to indicate both poisonous substances introduced into the body from without, and those generated within the body itself. In the former class we have the toxæmia of pregnancy. An infant born of an eclamptic mother may suffer from fatal convulsions; or an infant being nursed by an eclamptic woman may absorb the toxins from her, and so develop convulsions. An infrequent cause of convulsions is an encephalopathy due to lead poisoning. In the nursing infant the source of the lead is usually a lead nipple shield, or an ointment containing lead which has been used on the breasts of the mother and not properly washed off before nursing. In the older infant the source is to be sought in paint which the child may have nibbled from his crib, a verandah railing or other painted article. I have seen one case of strychnine poisoning with convulsions in a child who had swallowed a number of his mother's A.B.S. and C. pills.

In the second group, those due to toxins generated within the body, I would class those occurring at the onset, or during the course of various infectious diseases. They are very common at the onset of lobar pneumonia, scarlet fever, malaria and acute indigestion. Kerley[6] states that "over 90 per cent of the cases of convulsions coming under his notice have been due to gastro-intestinal disorders, most frequently in the form of acute indigestion, due to unsuitable articles of food. Rachitic children have supplied many of these cases." It is suggested that latent tetany is largely the responsible factor in Kerley's cases. Convulsions occur more frequently with whooping cough than with any other infectious disease. It has been customary to regard these as being due more to asphyxia, cerebral œdema or hæmorrhage, rather than to a toxin. Recently Powers[7] has questioned this view, claiming that "many cases of whooping cough with convulsions have tetany as their basis, as indicated, if not by the physical signs, then by a lowered blood calcium, or by electric hyper-irritability of the nerves."

Convulsions ending fatally are not infrequently associated with enlargement of the thymus gland, and are always associated with the condition known as status lymphaticus. The frequency of the association has led some to assume a causal relationship between the enlarged thymus and convulsions. The truth of this we doubt seriously. Morse[8] states that he has never seen a single convulsion occurring at long intervals which he thought could be attributed to toxæmia from the thymus, or pressure due to its enlargement.

In cases due to toxic causes, the treatment, other than symptomatic, is entirely the treatment of the condition which is the exciting cause. It should always be borne in mind that when there is an associated tetany, it should receive active treatment as outlined, in order to prevent a recurrence of convulsions.

*IV. Organic.*—In the new-born, convulsions are rarely toxic, but are more frequently organic in origin. We find an increased proportion of organic causes in the new-born, which contrasts with the reverse condition in older children. This is due to the greater opportunity for traumatic injuries associated with hæmorrhage within the head, and to the prevalence of congenital defects manifesting themselves at this age. Intracranial hæmorrhage, either traumatic in origin or due to asphyxia from a prolonged and difficult labour, or associated with a hæmorrhagic diathesis, is the more common cause. The convulsions, which may be either tonic or clonic in character, usually begin within the first forty-eight hours, and may or may not be accompanied by temperature. Between the convulsive attacks the infant is extremely drowsy, refuses to nurse,

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and usually has to be fed by dropper, often with difficulty. Bulging of the fontanelle may be present. In all such cases the first procedure, necessary for diagnosis and for treatment, is a lumbar puncture. The spinal fluid may show gross blood, or it may be xanthochromic, yellow tinged, as a result of disintegration of the red blood cells. At the same time the bleeding and coagulation time should be taken. If these are high, indicating a hæmorrhagic diathesis, whole blood from the mother or father (30 c.c.) should be given subcutaneously at once, and repeated at twelve-hour intervals, until the bleeding and coagulation time becomes normal. In severe cases, with evidence of bleeding into other tissues, a transfusion is indicated. Fortunately the majority of such cases die. Those that survive as a rule constitute the cases of Little's disease, spastic paralysis and its associated mental deficiency.

Occasionally there is an exception, of which the following is an example:

*Case 2.*—Baby P., aged eight days, whom I saw in March, 1921. Vomiting, frequent green stools, drowsiness, refusal of the breast, and twitching of the arms and legs, were all present. Its weight was six pounds. Examination was negative excepting that the anterior fontanelle was bulging; all the sutures were separated by about one quarter of an inch; the circumference of the head was fourteen and a half inches. A lumbar puncture was done, and 10 c.c. of blood stained spinal fluid withdrawn. Thirty c.c. whole blood from the father were given intramuscularly. A lumbar puncture was done daily, and an intramuscular injection of a similar amount of whole blood was given for five days. On the sixth day the spinal fluid was clear and showed no red cells. He is now five and a half years old, and except for a slight strabismus he is physically and mentally normal.

In infants, especially when the convulsions are accompanied by vomiting, high temperature, rigidity of neck, and a tense bulging fontanelle, meningitis should be suspected immediately. In older children the onset may be accompanied by a convulsion, but the predominant symptom is headache, which is usually associated with high temperature, irritability and persistent vomiting. A lumbar puncture should be done at once, and the laboratory report as to sugar, globulin, number and character of cells, and organisms will make the diagnosis clear and indicate the treatment. In all cases where the spinal fluid is cloudy, the meningococcus should be suspected as the causative organism; and antimeningococcus serum should be administered intraspinally daily, until such time as the diagnosis is, or is not, confirmed by the laboratory. Meningitis due to the pneumococcus, streptococcus, staphylococcus, or to tubercle or influenza bacilli is invariably fatal.

*V. Reflex causes.* — Teething is commonly thought by the laity to be a cause of convulsions, and it is a diagnosis frequently concurred in by physicians. In fact teething is so frequently the diagnosis of most of the common ailments of infancy, that I am compelled to lay down the following axiom: Except for slight refusal of food, some restlessness, a moderate nasopharyngitis, and a temperature, never above 101° per rectum, teething produces nothing but teeth. In older children the common diagnosis is worms. There has been an occasional case reported in the literature of convulsions ceasing after the passage of several round worms. While this is a rare cause, a stool examination for parasites and ova is necessary in all cases of convulsions without demonstrable physical findings. I think it wise to consider teething, worms, phimosis, and foreign bodies in the ear or nose, as incidental rather than as a cause, of a convulsion.

The differential diagnosis of convulsions as shown in Abt's[9] Pædiatrics practically summarizes this paper. It is as follows:

1. Careful history.
2. Age of child; in the new-born more likely to be organic; under three months there is rarely tetany or spasmophilia; six months to three years look for spasmophilia. Erb and Chvostek signs; do not forget that spasmophilia may be incidental and organic disease be present also; over three years look for infectious disease; if repeated over twenty-four hours look for organic disease of the nervous system, and do a lumbar puncture.
3. *With temperature.*
   (a) Infectious diseases.
   (b) Acute disease of nervous system; if repeated and lasting more than twenty-four hours do a lumbar puncture.
   (c) Retraction of head is likely in organic cases.
   (d) Beginning locally, and remaining so for some hours, more likely organic in origin.
   (e) Markedly accentuated orbicularis contractions with very little or no involvement of the extremities, usually denote organic origin.
   (f) Gastro-enteric in origin.
4. *Without temperature.*
   (a) Spasmophilia; test galvanic reaction.
   (b) Epilepsy, convulsions occurring in older children without temperature, with previous complete well being, followed by some drowsiness, and quick return to normal condition.

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# DIABETIC LIPÆMIA RETINALIS

## With Report of a Case

By Lillian A. Chase, B.A., M.B.

*Regina, Sask.*

OWING to the rarity of this condition the following case is of interest.

*Report of case.*—A mechanic aged thirty-four, who had known for one and one-half years that he hda diabetes, was first seen by me at 4.30 p.m., June 24, 1926. His early symptoms were thirst, frequency, and loss of weight. Treated in another province one and one-half years ago he went sugar free on a daily diet of 24 grms. protein, 164 grms. fat, 70 grms. carbohydrate. He stayed on this diet for about two months, then became careless about carbohydrates, but kept up the high fat. He was taking about half a pint of 40 per cent cream, and about 40 grms. of butter daily. His former symptoms came back three months ago; he became so weak that he had to stop work in the garage. For a few days he was in bed but got a little better and went to work again, then had to stop. He came in sixty miles on the train; weakness was his chief complaint. He walked about comfortably, and was not acutely ill.

*Past illnesses.*—Fracture of right humerus at sixteen; left herniotomy at twenty-four; right herniotomy at twenty-seven; influenza at twenty-four and at thirty.

*Family history.*—Mother alive and well, aged seventy. Father died at seventy-five, unknown cause. One brother and one sister alive and well. No family history of diabetes.

*Personal history.*—Born in the United States, has lived in Canada since age of six, homesteaded in the west doing his own cooking most of this time; has worked as a tinsmith; is now a garage man. Height five feet six inches. The face was of a waxy, ivory-like pallor. This was accentuated by the dark brown eyes and the bald head. There was an acetone odour to the breath. Tongue and mucous membranes were pale. Two upper molars were decayed, an abscess pointing to the exterior of alveolus was seen at the root of one. Tonsils not enlarged. Thyroid not enlarged. *Cardio-vascular system*: arteries not hard, pulse rate 90—regular. Heart: point of maximum impulse 12 cm. from the mid-line; sounds of fair quality; no murmurs. Blood pressure: systolic 90, diastolic 64. *Abdomen*: liver and spleen not felt. No areas of tenderness. Double hernia scars. Legs œdematous up to knees. Reflexes, not obtained except in the eye.

*Eye.*—Eyes reacted to light and accommodation. There was little retinal reflex; all vessels appeared as thick, ivory-coloured tubes on light ivory-coloured background of choroidal vessels; the vessels appeared larger than normal. It was impossible to distinguish between arteries and veins because they were both the same colour. There was absence of light streak. The vessels were raised in bold relief. Fig. 1 is a diagrammatic representation of this condition.

On the sixth insulin day, the retinal reflex was normal. There was a small central streak of ivory in the vessels. The vessel terminals were red. Fig. 2 is a diagrammatic representation of this.

On the twenty-second insulin day the vessels were normal and the red reflex was normal. Fig. 3 is a diagrammatic representation of this.

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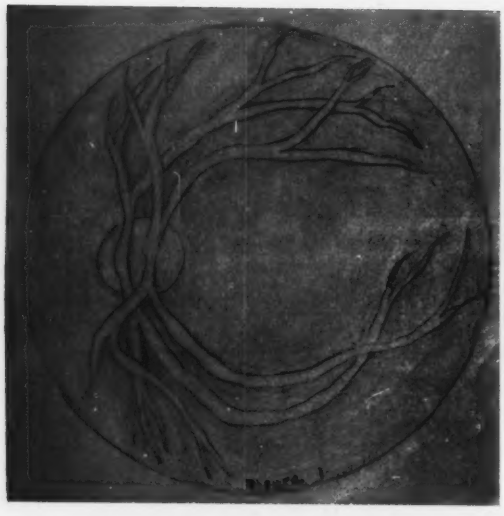

FIG. 1.—Diagrammatic representation of eye ground.

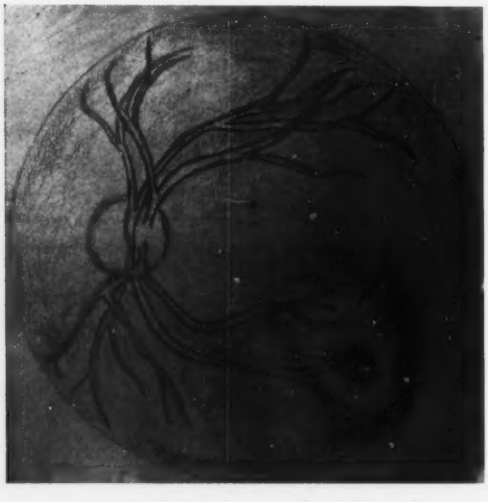

FIG. 2.—After six days of insulin centre of the vessels show ivory streak.

Laboratory.—Blood was withdrawn for blood sugar. As it came into the syringe it was an opaque coral pink. When oxalated, the fat settled out in a very few minutes to about two-thirds by volume. The fat estimated by the Babcock method was 48 per cent. The fat was soluble in ether, insoluble in alcohol. Blood sugar was 0.210 per cent. $CO_2$ combining power of the blood was 40. Red blood corpuscles 3,200,000. White blood count could not be done, as the blood was too opaque. Urine: Sp.gr. 1033; sugar 3 per cent; acetone, three plus; diacetic acid, three plus. Wassermann, done after plasma cleared, negative.

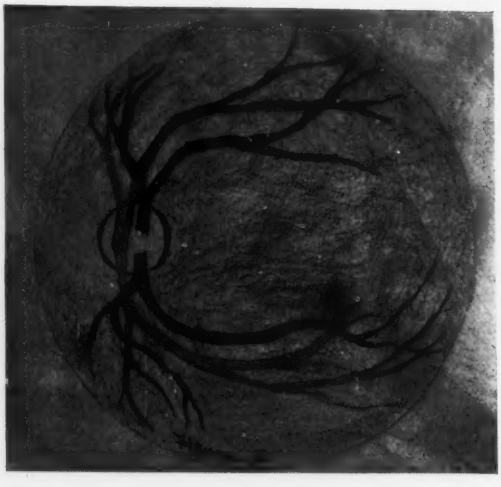

FIG. 3.—After twenty-one days of insulin. Normal.

*Progress notes.*—The patient got rooms in the city, bought scales, and weighed his food carefully. He was put on a diet low in fat to see if this would have any effect on the blood fat. After five days of this diet the fat was not decreasing, nor was the glycosuria clearing up. A slight infection in the right cheek showed much swelling. Acne was appearing on the back of the neck. The œdema of the legs was getting worse. The acetonuria was slightly decreasing.

Insulin was begun on the sixth day, twenty units the first day, thirty the second. He went almost sugar free in three days of insulin. After six days of insulin the blood fat had dropped to 22 per cent, about one-half its original amount. It took fifteen days of insulin to clear up the visible fat. On the tenth day of insulin he had two upper molars extracted. Cultures from these teeth showed Gram-positive diplococci.

Œdema of the legs gradually cleared up. Minor infections ceased to appear. On the sixth insulin day $CO_2$ combining power was 65. White blood corpuscles were 3,000. The first reaction on the evening of seventh insulin day was fairly severe. On the twenty-seventh insulin day he went home. He sent me blood preserved by sodium fluoride and thymol, on August 11th. On September 5th he wrote that he was gaining strength every day. On October 28th he wrote that he was feeling well and that

his weight was 158 pounds, that is, he gained thirty-three pounds in four months.

*Comment.*—Bloor[1] says that the blood plasma in the post-absorptive period is normally clear although containing appreciable amounts of material of a fatty nature which is insoluble in water, that is, cholesterol, cholesterol esters, lecithin and probably also some fat. The introduction of more fat into the blood, whether by feeding or by mobilization from the fat stores generally produces a milkiness, normally lasting only a few hours, but which in certain conditions, mainly pathological, persists for considerably longer periods.

In human beings the plasma contains normally 0.5 to 0.8 grms. of lipoid per 100 c.c. Though lipæmia may be produced by hæmorrhage first demonstrated by Boggs and Morris, diabetes is the only disease where it is at all frequent. The diminishing power to remove fat from the blood is referable to the inadequate supply of the pancreatic hormone. Allen says that diabetic lipæmia evidently represents some secondary breakdown in fat metabolism, not directly connected with the endocrine function of the pancreas.

The combination of active severe diabetes and a high fat diet is undoubtedly most conducive to lipæmia. Some degrees of lipæmia. however, may be reckoned among the most stubborn symptoms of diabetes, and may persist for at least several weeks after the disappearance of both hyperglycæmia and acidosis on diets very low in fat and total calories.

No uniform parallelism has been found between the sugar or acetone in blood or urine, and the accompanying degree of lipæmia, the same is true of the $CO_2$ capacity of the plasma, also the giving of carbohydrate or its exclusion from the diet, seems not to be a deterring factor in lipæmia. Allen[2] says that the multitude of investigations by both chemical and anatomical methods have failed to afford any such clear conception of fat metabolism as exists for carbohydrate and protein metabolism. In diabetic lipæmia the increase of fat substances is greater in the plasma than in the corpuscles (H. Gray[3]).

*Lipæmia retinalis.*—The name favoured by the discoverer, Heyl, of Philadelphia, was intraocular lipæmia, but subsequently students have preferred his second choice, *lipæmia retinalis.* Lipæmia angioretinalis was suggested as more accurate by Cohen in 1921 but seems unlikely to supplant the original term of forty-three years standing.

The diagnosis is based on the ophthalmoscopic aspect of the vascular net: (1) as to colour, variously described as light salmon (Heyl), strawberry and cream (White), milky (Heine), light pink (Koellner, Darling), creamy, waxy (Heine, Koellner), ground glass effect, malted milk, silvery sheen or glow (case 28); (2) as to size of vessels, seemingly about twice the size of normal diameter (Heyl); (3) as to similarity of arteries and veins; (4) as to the flat ribbon-like aspect of the vessels accompanied by absence of the light streak; (5) conversely, as to unusual breadth of the light streak.

Thirty-four cases of lipæmia retinalis have been reported. Muskat[4] reviewed the literature and reported the thirty-first case. Since then Rowe,[5] Machlis[6] and Bantin[7] have reported cases, making this one the thirty-fifth reported.

McCann[8] of Johns Hopkins says that the experience in his clinic would indicate that the condition is much more common than one would suppose from the infrequency of case reports. It has been observed twice in his clinic in eighteen months from among 150 patients with diabetes.

Bantin[7] describes fat embolism as seen in the veins with a pulse rate of 120; it is difficult to understand how in such swiftly moving blood, separate fat globules could be distinguished.

The natural explanation for the appearance of retinal lipæmia has been sought for by chemical determination of the ether soluble fraction of the circulating blood. In twenty-eight of the cases cited the average of the total fat was 9 per cent, ranging from 26.25 per cent (Koellner) down to 4.24 per cent in case twenty-seven and 3.5 per cent (Wagener[9]). This case showed a higher blood fat than any previously reported.

When the blood fat diminishes retinal vessels appear a much more normal pink or even perfectly normal. The interval of disappearance ranges from ninety-six hours to twenty-four days. In this case the time was fifteen days. In case 28 the blood fat varied from 6.3 per cent to 2.95 per cent in ninety-

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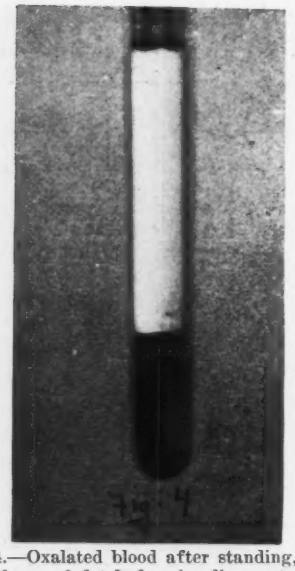

FIG. 4.—Oxalated blood after standing, showing the relative volume of fat before insulin treatment.

FIG. 5.—Oxalated blood showing relative volume of fat after insulin treatment.

six hours. The shortness of the periods, together with the relative closeness of the fat figures, synchronous with the presence and absence of retinal lipæmia enables us to limit the threshold to between 3 per cent and 6 per cent of plasma lipoids (Bloor's method). More accurate fixation of the critical level will evidently require a fat determination daily or oftener, with due regard to the time elapsing between the last meal and the veni-puncture. In this case the Babcock method was the only method of fat estimation available.

*Acidosis.*—The data on this are not very complete; ferric chloride is positive in at least 51 per cent of cases, sixteen cases are not stated, ten cases are negative.

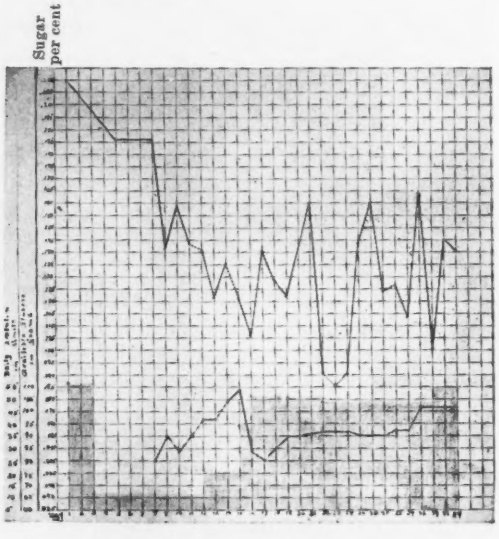


FIG. 6.—Chart showing relation between blood sugar, insulin and available glucose in the diet.
Upper line blood sugar.
Lower line insulin. Solid glucose.

The extremes of the blood $CO_2$ were 56 per cent on admission when the retinal lipæmia was noted (Hardy) and 1 per cent by volume, five hours before death. This last low figure may be sceptically received in view of the rarity of a value as low as 6 per cent by volume.

*Blood sugar.*—This was stated only after 1921, ranged from 0.18 per cent to 0.54 per cent, (McGuire), rose during eight weeks' observation to 0.65 per cent at the same time as the blood fat fell to 3.7 per cent and the fundi became clear.

*Urine Sugar.*—Data are defective. The highest reported was 660 grms. in twenty-four hours (Fraser).

*Age.*—Retinal lipæmia has been said to be a terminal symptom of juvenile diabetes (Koellner and Moore). The facts for twenty-four patients are, the youngest was nine years. (Wagener) the average age is twenty-five, the oldest fifty-one (Case 17).

*Sex.*—Four were women, sex of two not stated

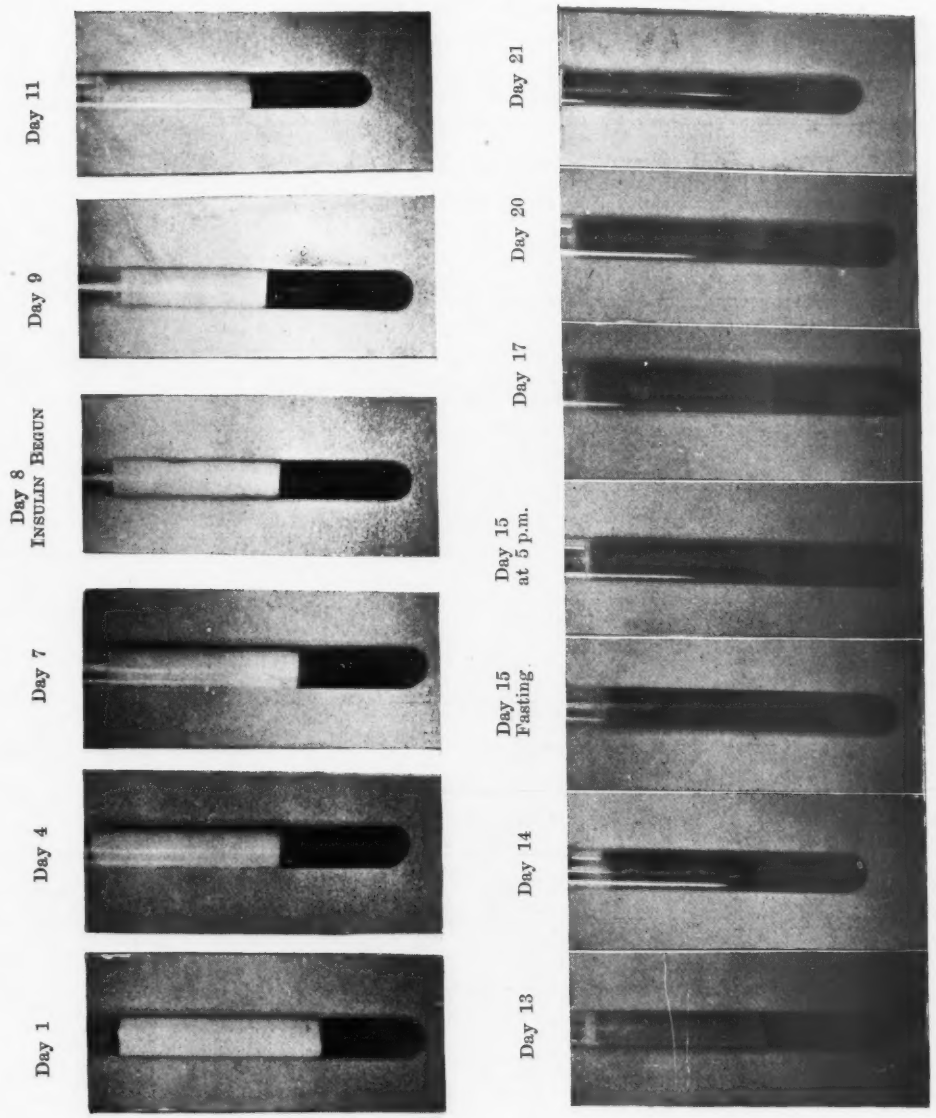


Fig. 7.

and twenty-eight were male. Probably the factor of sex has no significance.

*Soft eyeball.*—Hypotonia bulbi as a sign peculiar to diabetic coma was first reported by Krause in 1904, and in conjunction with lipæmia retinalis by the same observer in 1906, later by others.

*Condition on discharge.*—Death occurred in 57 per cent of the series, one had pneumonia, ten clearly had coma; and probably that was the fatal condition in five others also.

*Duration.*—From diagnosis to death or discharge twenty hours (Moore), seven weeks (Heyl and Darling), nine weeks (Koellner). Four months and nineteen days (Case 37). These long intervals before death together with recovery prove that the outlook while grave like that of hyperglycæmia in general is by no means immediately alarming.

## *Summary*

A case of diabetic lipæmia retinalis is reported which showed hyperlipæmia, hyperglycæmia,

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TABLE NO. 1

DETAILED DATA OF THE CASE

Mr. W. C.

| Date | | Vol. c.c. | R. | Urine Sp. G. | Urine Sugar Gms. | Urine Sugar SNP | Urine Ketones FeC 13 | Blood Sugar | Food Intake Prot. | Fat | CHO | G | Total Cal. | Insulin Time | Insulin Uts. | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| June | D | 2880 | | 1036 | 80 | xxxx | xx | | 44 | 164 | 70 | 112 | 1932 | | | $CO_2$. Comb. power 40. Eyes Fig. 1. Fat 48%. R.B.C. 3,200,00. |
| | N | 1440 | H | 1033 | 28 | xxxx | xx | .210 | | | | | | | | |
| June 25 | D | 1050 | | 1030 | 21 | xxxx | xx | | | | | | | | | |
| | N | 720 | H | 1026 | 20 | xxxx | xx | | | | | | | | | |
| June 26 | D | 960 | | 1028 | 16 | xxxx | xx | | | | | | | | | |
| | N | lost | H | | | | | | 48 | 48 | 33 | 66 | 696 | | | |
| June 27 | D | 960 | | 1035 | 21 | xxxx | x | | | | | | | | | |
| | N | 480 | H | 1033 | 11.5 | xxxx | x | | | | | | | | | |
| June 28 | | lost | | | | | | .181 fstg. | | | | | | | | |
| June 29 | | lost | | | | | | | | | | | | | | |
| June 30 | D | 960 | | 1032 | 38 | xx | x | | | | | | | | | Infection of right cheek, œdema of legs and feet. |
| | N | 960 | H | 1035 | 58 | xxx | x | | | | | | | | | |
| July 1 | D | 1000 | | 1030 | 14.5 | xxx | x | .181 fstg. | | | | | | 10.00 a.m. | 10 | |
| | N | 480 | H | 1015 | 4.5 | xxx | x | | | | | | | 7.00 p.m. | 10 | |
| July 2 | D | 460 | | 1025 | 2 | xx | 0 | .141 fstg. | | | | | | 10.00 | 20 | |
| | N | 700 | H | 1014 | 1 | x | 0 | | | | | | | 7.00 | 10 | |
| July 3 | D | 960 | | 1011 | 1.3 | x | 0 | .157 fstg. | | | | | | 10.00 | 13 | |
| | N | 065 | H | 1011 | 0 | x | 0 | | | | | | | 7.00 | 10 | |
| July 4 | D | 970 | | 1013 | 0 | x | 0 | .143 fstg. | | | | | | 10.00 | 20 | |
| | N | 490 | H | 1025 | 0 | x | 0 | | | | | | | 7.00 | 10 | |
| | | | | | | | | | | | | | | 10.00 | 12 | |
| July 5 | D | 500 | | 1018 | 0 | x | 0 | .141 fstg. | | | | | | 1.30 | 12 | |
| | N | 480 | H | 1023 | 0 | x | 0 | | 55 | 25 | 42 | 76 | 613 | 7.00 | 12 | |
| | | | | | | | | | | | | | | 10.00 | 12 | |
| July 6 | D | 960 | | 1011 | 0 | x | 0 | .122 fstg. | | | | | | 1.30 | 12 | Eyes Fig. 2. $CO_2$ |
| | N | 560 | H | 1018 | 0 | x | 0 | | 55 | 21 | 42 | 76 | 577 | 7.00 | 12 | 70. W.B.C. 3,000. |
| July 7 | D | 940 | | 1021 | 0 | x | 0 | .135 | | | | | | 10.00 | 12 | Reaction at 8 p.m. |
| | N | 960 | H | 1010 | 0 | 0 | 0 | | | | | | | 1.30 | 12 | 2½ lumps of sugar |
| | | | | | | | | | | | | | | 7.00 | 20 | |
| July 8 | D | 1340 | | 1011 | 0 | 0 | 0 | .122 | | | | | | 10.00 | 14 | Slight reaction at |
| | N | 960 | H | 1015 | 0 | 0 | 0 | | 55 | 21 | 60 | 94 | 649 | 1.30 | 14 | 1 p.m., ate a to- |
| | | | | | | | | | | | | | | 7.00 | 14 | mato. |
| July 9 | D | 1460 | | 1011 | 0 | 0 | 0 | .105 fstg. | | | | | | 10.00 | 14 | Slight reaction be- |
| | N | 1445 | N | 1018 | 0 | 0 | 0 | .053 at 72 5 p.m. | 46 | 60 | 106 | 942 | | 1.30 | 14 | fore noon—weak |
| | | | | | | | | .064 at 6 p.m. | | | | | | 7.00 | 0 | |
| July 10 | D | 1480 | | 1014 | 0 | 0 | 0 | .141 fstg. | | | | | | 10.00 | 10 | |
| | N | 1440 | N | 1014 | 0 | 0 | 0 | .129 12 noon | | | | | | 1.30 | 0 | |
| | | | | | | | | | | | | | | 7.00 | 10 | 2 teeth out. |
| July 11 | D | 1420 | | 1011 | 0 | 0 | 0 | .127 fstg. | | | | | | 10.00 | 10 | |
| | N | 960 | N | 1021 | 0 | 0 | 0 | | 72 | 46 | 60 | 106 | 942 | 1.30 | 5 | |
| | | | | | | | | | | | | | | 7.00 | 10 | |
| July 12 | D | 1440 | | 1012 | 0 | 0 | 0 | .122 fstg. | | | | | | 10.00 | 10 | R.B.C. 3,000,000. |
| | N | 970 | N | 1020 | 0 | 0 | 0 | .133 at 12 noon—2 hours after breakfast | | | | | | 1.30 | 10 | W.B.C. 7,000. |
| | | | | | | | | .133 at 3—1 hour after dinner | | | | | | 7.00 | 10 | |
| | | | | | | | | .103 at 5—3 hours after dinner | | | | | | 10.00 | 10 | |
| | | | | | | | | | | | | | | 1.30 | 10 | |
| | | | | | | | | | | | | | | 7.00 | 10 | |
| July 13 | D | 1450 | | 1020 | 0 | 0 | 0 | .158 fstg. | | | | | | | 10 | |
| | N | 940 | | 1015 | 0 | 0 | 0 | | | | | | | | 10 | Fat 22%. |
| | | | | | | | | | | | | | | | 10 | |

TABLE NO. 1—Continued

DETAILED DATA OF THE CASE

Mr. W. C.

| | URINE | | | | | | BLOOD | FOOD INTAKE | | | | | INSULIN | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Sugar | | Ketones | | | | | | Total | | | |
| Date | Vol. c.c. | R. | Sp. G. | Gms. | SNP | FeC 13 | Sugar | Prot. | Fat | CHO | G | Cal. | Time | Uts. | |
| July 14 | D 1500 | | 1010 | 0 | 0 | 0 | | | | | | | | 12 | |
| | N 1000 | | 1017 | 0 | 0 | 0 | | 72 | 24 | 60 | 104 | 744 | | 10 | |
| | | | | | | | | | | | | | | 10 | |
| July 15 | D 1430 | N | 1018 | 0 | 0 | 0 | .091 fstg. | | | | | | | 12 | B.P. 84 systolic. |
| | N 990 | N | 1018 | 0 | 0 | 0 | | | | | | | | 10 | 62 diastolic |
| | | | | | | | | | | | | | | 10 | |
| July 16 | D 1920 | N | 1017 | 0 | | | .085 fstg. | | | | | | | 12 | |
| | N 1440 | N | 1017 | 0 | | | | | | | | | | 10 | |
| | | | | | | | | | | | | | | 10 | |
| | | | | | | | | | | | | | 10.00 | 12 | |
| July 17 | D 1500 | N | 1014 | 0 | | | .091 fstg. | | | | | | 1.30 | 10 | |
| | N 1440 | N | 1014 | 0 | | | | | | | | | 7.00 | 8 | |
| July 18 | D 1920 | N | 1012 | 0 | | | .144 fstg. | | | | | | 10.00 | 12 | |
| | N 1900 | N | 1010 | 0 | | | | | | | | | 1.30 | 10 | |
| | | | | | | | | | | | | | 7.00 | 8 | |
| July 19 | D 1930 | N | 1007 | 0 | | | .160 fstg. | | | | | | 10.00 | 12 | |
| | N 960 | N | 1021 | 0 | | | | | | | | | 1.30 | 10 | |
| | | | | | | | | | | | | | 7.00 | 8 | |
| July 20 | D 1920 | N | 1012 | 0 | | | .127 fstg. | | | | | | 10.00 | 12 | |
| | N 1400 | N | 1016 | 0 | | | | | | | | | 1.30 | 10 | |
| | | | | | | | | | | | | | 7.00 | 8 | |
| July 21 | D 1950 | N | 1006 | 0 | | | .132 fstg. | | | | | | 10.00 | 12 | |
| | N 1420 | N | 1010 | 0 | | | | 60 | 91 | 60 | 104 | 1299 | 1.30 | 10 | |
| | | | | | | | | | | | | | 7.00 | 10 | |
| July 22 | D 1910 | H | 1015 | 0 | | | .119 fstg. | | | | | | 10.00 | 12 | |
| | N 1410 | H | 1006 | 0 | | | .069 at 10 p.m. | | | | | | 1.30 | 10 | Eyes Fig. 3. |
| | | | | | | | | | | | | | 7.00 | 10 | |
| July 23 | | | | | | | | | | | | | 8.00 | 12 | |
| | | | | | | | | | | | | | 12.00 | 10 | |
| | | | | | | | | | | | | | 5.30 | 10 | R.B.C. 3,200,00. |
| July 24 | | | | | | | | 60 | 117 | 60 | 106 | 1533 | 8.00 | 12 | |
| | | | | | | | | | | | | | 12.00 | 10 | |
| | | | | | | | | | | | | | 5.30 | 10 | |
| July 25 | D 960 | H | 1024 | 0 | | | | | | | | | 8.00 | 12 | |
| | N 970 | H | 1022 | 0 | | | | | | | | | 12.00 | 10 | |
| | | | | | | | | | | | | | 5.30 | 10 | |
| July 26 | N 960 | H | 1022 | V.f.t. | | | .167 fstg. | 60 | 142 | 60 | 109 | 1758 | 10.00 | 12 | B.P. 88 systolic |
| | | | | | | | | | | | | | 1.30 | 10 | 64 diastolic |
| | | | | | | | | | | | | | 7.00 | 10 | |
| July 27 | D 1000 | H | 1012 | 0 | | | | | | | | | 8.00 | 12 | |
| | N 900 | H | 1025 | 0 | | | .102 at 10 p.m. insulin at 5.30 supper at 6 | | | | | | 12.00 | 10 | |
| | | | | | | | | | | | | | 5.30 | 10 | Went home. |
| Aug. 5 | | | | 0 | | | .097 at 2 p.m.—2 hours after dinner | | | | | | 7.30 | 14 | |
| | | | | | | | | | | | | | 11.30 | 12 | |
| | | | | | | | | | | | | | 5.30 | 10 | |
| | | | | | | | | | | | | | 7.30 | 14 | |
| Aug. 11 | | | | 0 | | | .100 fasting | | | | | | 11.30 | 12 | |
| | | | | | | | | | | | | | 5.30 | 10 | |
| | | | | | | | | | | | | | 7.30 | 14 | |
| Sept. 24 | | | | 0 | | | .150 fasting | | | | | | 11.30 | 12 | |
| | | | | | | | | | | | | | 5.30 | 10 | |
| Oct. 28 | | | | 0 | | | .146 fasting | | | | | | 7.30 | 14 | |
| | | | | | | | | | | | | | 11.30 | 12 | |
| | | | | | | | | | | | | | 5.30 | 10 | |

acidosis and glycosuria. The glycosuria and acidosis cleared up rapidly on insulin.

The lipæmia cleared up in fifteen days of insulin treatment.

The patient went home much improved.

I am indebted to Dr. W. M. R. Palmer for assistance with the examination of the eye, to Dr. O. Taylor for the estimation of the blood fat, to Dr. Margaret Chase for looking up the literature in the library of the College of Physicians, Philadelphia.

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# A CASE OF PLACENTA ACCRETA*

BY D. S. FORSTER, M.A., M.D.

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THE pathological condition known as placenta accreta is one of the rarer complications of pregnancy. Polak has estimated its incidence to be about one in 6,000 deliveries. During the past six years there have been nearly 8,000 deliveries in the service of the Montreal Maternity Hospital with only one case, the one reported below. It is not so much the comparative rarity of the condition that has prompted this report as the very serious results which follow, when the abnormality is not recognized and properly treated.

The normal placenta consists of certain structures which are readily demonstrated histologically, and each of these performs a definite function. When one views a section of placental tissue, the most conspicuous constituents, for they compose by far the greater bulk, are the villi and inter-villous blood spaces. Beneath the villi, and penetrated in places by them, lies the decidua basalis, the maternal portion of the placenta. This consists mainly of decidual cells which are modified stroma cells of the endometrium; in it may also be seen blood-vessels, uterine glands, and in its superficial portions fœtal ectoderm mingled with the decidual cells. Normally the decidua is everywhere interposed between the villi and the uterine musculature. Its presence during labour is of the utmost importance for the reason that it makes possible the separation of the placenta, the ragged, torn surface of which is the decidua itself that has been split off, remaining attached to the villi.

FIG. 1.—Low power microphotograph of a portion of placenta and uterine wall, showing the decidua interposed between the villi (above) and the musculature.

When the placenta fails to be delivered, following the birth of the child, there are two conditions either of which may be present. The placenta, after separation from the uterine wall, may be retained in the birth canal. Such a case

* From the pathological department of the Montreal General Hospital.

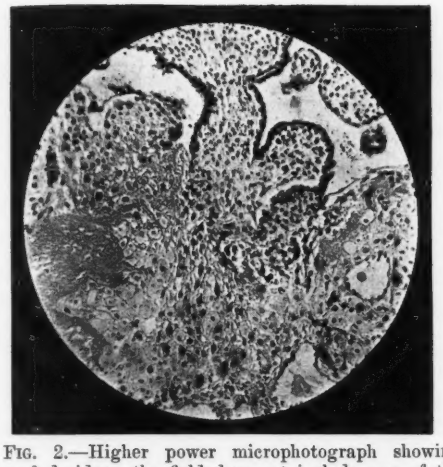

FIG. 2.—Higher power microphotograph showing villi and decidua; the field does not include any of the musculature. Both this and the preceding are early placentæ.

would show bleeding, descent of the cord and a round, firm fundus several centimetres higher than the position it had occupied immediately after the birth of the child. The other possibility is that of adherent placenta, in which condition separation from the uterine wall has not occurred. There would therefore be no bleeding from the placental site, no descent of the cord, and intermittent uterine contractions would still be felt.

In the presence of an adherent placenta, the gloved hand, introduced into the uterus under careful aseptic precautions, may be able to demonstrate a line of cleavage, and so remove the products of conception. Such a situation might be found when the placenta is large and thinned out, or when implantation has occurred in a tubal corner. When no line of cleavage can be found, one may be dealing with a placenta accreta, an entirely different problem, which demands different treatment.

Placenta accreta is the result of absence of decidua at the placental site. Hence the villi penetrate the uterine musculature, making separation of the placenta from the latter utterly impossible. Histological sections of other varieties of adherent placenta invariably show a decidua basalis to be present; the placenta has therefore not become an intimate part of the musculature, for the latter has not been penetrated by the villi, and a line of cleavage exists. Manual removal is then possible. When, however, there is no decidua, there can be no line of cleavage, for the villi have penetrated and become intermingled with the muscle fibres of the uterine wall. Hence removal, either manual or instrumental, is not practicable. The causes of this condition are obviously those which lead to destruction of the uterine mucosa; they would include repeated or too vigorous curettage, endometritis, sub-mucous fibroid and previous manual removal. A history of any of these should make one prepared to deal with a placenta accreta, as is shown by the following case.

The patient was Jewish, thirty-two years of age, born in Russia. Her menstrual history was said to be normal. She had had typhus five and one-half years before coming under observation, but recalled no other illnesses apart from her previous pregnancies of which there were three. None of the labours were instrumental. The second child was born dead following a blow in the mother's abdomen; on this occasion the after-birth was removed with instruments. At her third pregnancy the placenta had to be removed manually; there was considerable hæmorrhage and the patient remained in bed for two months.

When seen during her fourth pregnancy, about four months before term, she was complaining of constipation and occasional headaches; her blood-pressure was 110-68 and the urine was negative. Three months later, she had no headaches, no disturbances of vision, but felt faint; there was slight œdema of the ankles, the blood-pressure had risen to 158-100, and the urine showed a small amount of albumin. The fœtal heart sounds were normal. She was advised to enter a hospital, but was again heard from only at term, three weeks later. At this time she had not felt the baby for nearly two weeks, and the fœtal heart could not be heard. The blood-pressure was recorded as 132-82, and the urine still contained only a trace of albumin. She was complaining of headache, pain in the back, and of slight bleeding from the vagina.

On the following day, a dead fœtus was delivered; the presentation was a breech, and there was considerable difficulty in delivering the after-coming head. The placenta did not follow. Attempts to express it, even under general anæsthesia, failed. With due aseptic precautions, an attempt was made at manual removal, but resulted in the tearing away of only two small

cotyledons. This caused a brisk hæmorrhage, and a gauze pack was inserted.

At this stage the patient was admitted to the Montreal Maternity Hospital where a hysterectomy was performed. (Hosp. No. 21910-25: service of Dr. H. M. Little). The gauze pack was not removed before operation, there was no excessive bleeding and the patient left the operating room in excellent condition. Two weeks later, she was discharged from the hospital. The highest temperature recorded during this interval was 100°.

The specimen, consisting of uterus and placenta, presented macroscopically two interesting features. The first was that the placenta, of varying thickness, covered the whole of the interior of the uterus. The second observation helped to confirm the diagnosis of placenta accreta which clinically had already been made; a normal line of cleavage could not be found. There still remained, in order to establish this diagnosis beyond a doubt, the histological examination of sections including both the placenta and the uterine wall. Owing in all probability to the death of the fœtus which had occurred possibly two weeks before birth, there was found to be a certain amount of degeneration of the tissues, but it was still easily possible to demonstrate absence of decidua and direct contact of villi with the uterine musculature.

The most logical treatment of such a condition appears to be that employed in the above case and strongly advocated by Polak,[1] namely, hysterectomy. Attempts to remove the placenta generally lead to hæmorrhage, infection and perforation. The experience of other clinicians, so

FIG. 3.—Gross specimen; uterus and placenta.

FIG. 4.—Low power microphotograph showing placental tissue and musculature intermingled. There is no decidua. Taken from region marked 4 in above drawing.

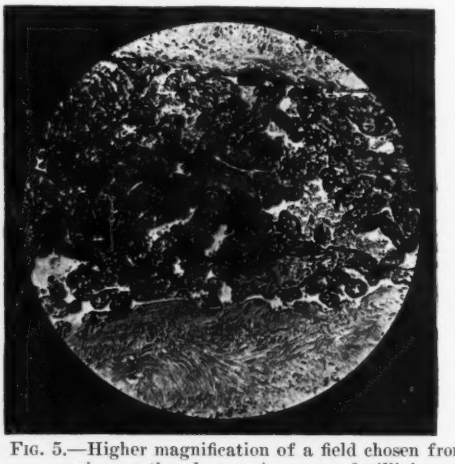

FIG. 5.—Higher magnification of a field chosen from the same region as the above. A group of villi is seen to be in direct contact with muscle tissue on either side.

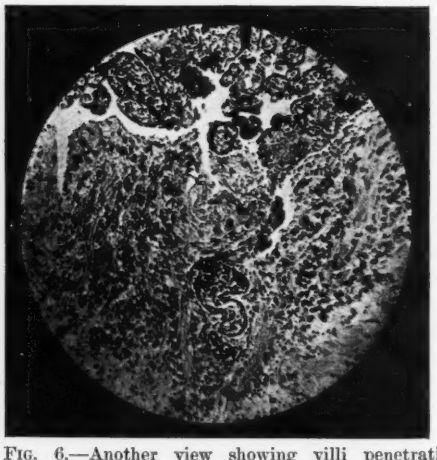

FIG. 6.—Another view showing villi penetrating the uterine musculature.

far as recorded, supports this view which harmonizes absolutely with the histological picture. Dietrich,[2] in 1922, had such a case and found records of nineteen others in which there was absence of the decidua basalis; in the majority of these, death occurred from hæmorrhage. C. J. Andrews,[3] in 1924, reported a case which had a history of endometritis and curettage. As in the history given above, Andrews' patient was delivered of a macerated fœtus at term, there having been no fœtal movements felt for a short time before confinement, and the presentation was a breech. The placenta was thin, attached to a large surface, and showed no line of cleavage. Andrews, in this case, removed the placenta manually, in pieces, and then packed the uterus for thirty-six hours, but concludes that the safer and more logical treatment is hysterectomy. In 1925, Tennant, Wilson and Craig-Sullivan[4] reported a case which had a history of manual and instrumental removal of the placenta at previous pregnancies; in this instance the pathologist found a mass of placental tissue which had invaded the entire thickness of the uterine wall. The literature on the subject of placenta accreta is now accumulating more rapidly, but little has been added to the discussion of the abnormality by Polak, who concludes: "In the presence of an attached placenta without bleeding, aseptic exploration under anæsthesia should be made to determine the subsequent procedure. Finally, if no line of cleavage can be demonstrated, hysterectomy should be done."

I am indebted to the Hiram Vineberg Scholarship which has made it possible to carry on this work.

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# SEX FACTORS IN THE VERY YOUNG CHILD*

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OUR ideas on the subject of sex are usually of two kinds. Either we think of it in connection with the reproductive function, or else we associate it with the complicated influences it exerts—according to some psychologists—on the emotions of the adult and child. Neither of these aspects will concern us to any extent here; it is the biological side of the question and the clinical effects of sex as seen by the physician which will be considered.

It has long been known that though sex is found in almost all forms of life it is by no means necessary to all. Many of the lower forms of both plants and animals are apparently sexless. We also find all degrees of sex, including the hermaphrodite possessing the gonads of both sexes, and the species starting out as one sex and in the process of growth changing to the opposite sex and then back again.

In the higher forms we associate sex with the gonads. The testicle and the ovary are the distinguishing features of the two conditions, and the secondary characters of sex have always been associated with their hormones. In vertebrates the loss of these organs seems to affect the male more than the female. The castrated male takes on the appearance and adopts many of the characteristics of the female. This has led to the conclusion that the female is more close to the neuter, and that the male is a more highly differentiated type.

There are many theories as to the cause of the differentiation into sexes. Jordan believes that the human embryo is originally potentially hermaphroditic and that the differentiation is but at first an inhibition and then a suppression of

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XUM

the opposite sex primordium, so that two types of metabolism are possible; the preponderance of one results in "maleness" while that of the other gives rise to "femaleness." This conception has since been given considerable support by the now well known fact that the basal metabolic rate is always slightly higher in the male than in the female.

Thomas states somewhat the same theory in another way, and at the same time elaborates this in order to explain a great deal of the differences in the psychology of the two sexes. He says, "A grand difference between plant and animal life lies in the fact that the plant is concerned chiefly with the storing of energy, and the animal with consuming it. The plant by a very slow process converts lifeless matter into living matter, expending little energy and living at a profit. The animal lives upon the plant world and in contrast to plants lives at a loss of energy." Expressed in biological formula, the habit of the plant is predominantly anabolic, that of the animal predominantly katabolic.

Thomas and many other biologists have come to the conclusion that woman comes nearer to the metabolism of the plant than does man. Thomas is more difficult to follow, when he links up the question with nutrition, demonstrating that the female is the result of an abundance and the male is associated with a scarcity. His main argument is based on the fact that girls mature earlier than boys, and that the ill-nourished girl does not mature as soon as her well-nourished sister. Numerous instances are cited showing how in times of scarcity and famine more boys are born than girls.

More recently biologists have become pretty well agreed that the primary sex differentiation in mammals is due to the male being the heterogametic sex and that there are two different varieties of spermatozoa. Fertilization by one variety would result in maleness and by the other variety in femaleness. A disturbed primary sex ratio would ensue as a result of a differential activity, susceptibility, or mortality on the part of one of these two sorts of sperms. This theory would apportion the blame of disproportion in the sex ratio on the female as a medium for fertilization, and on the male for changes in the number or activity of the varieties of sperm.

The first stage in sex differentiation is the formation of ovaries or of testes from undifferentiated gonads. These organs then produce their own internal secretion which directs the development of the remaining structures of the sex equipment. There are numerous clinical indications, however, that the full development of many of the structures of the sex organization, or at least the rapidity with which they develop is conditioned by the action of the internal secretions of other glands of the endocrine system such as the pituitary, the adrenal and the thyroid. It is plain also that these sex determining substances are not produced in constant amount throughout the life cycle; that there is a different threshold of response at different stages in the development of an organ susceptible to such stimulus.

There seem to be definite forces at work to make it difficult for the mammal to have male offspring. This is seen in the fact that while there is a higher ratio of fertilizations resulting in maleness, there is greater viability of the female during its prenatal existence. This fact may also be noted in illegitimate children in whom owing to poor prenatal hygiene the mortality of males is much higher than that of females.

Vital statistics also show that in the battle of life the male is under a handicap from the start which continues right through early childhood. The following figures show the chance of survival for the different sexes from fertilization to the end of the first year:

For every 100 female abortions there are 160 male.
For every 100 female still-births there are 136 male.
For every 100 female living births there are 106 male.
At the end of the first year there are however only 100 males for every 103 females living.

From this time on through childhood the sex death rate curves run nearly parallel, with the male curve always slightly ahead of the female.

The following figures as to the sex factor in the incidence of the commoner diseases of childhood have been gathered largely from *Abt's System of Pædiatrics.*

| | *Preponderance in Males* |
|---|---|
| Hæmophilia | 1-0 |
| Epidemic meningitis | 2-1 |
| Lobar pneumonia | 2-1 |
| Broncho-pneumonia | 3-2 |
| Poliomyelitis | 3-2 |
| Scarlet fever | Slight |

| | *Preponderance in Females* |
|---|---|
| Whooping cough | 1.25-1 |
| Chorea | 2.2-1 |
| Hysteria | 7-1 |
| Diphtheria | Slight |
| Rheumatic fever | Considerable |

It will thus be seen that the male is especially susceptible to infections. It is interesting to note the incidence of pneumonia in the two sexes. This exists throughout life, but in the adult has been generally attributed to the greater exposure of the male, to the greater frequency of excesses, and to the hard manual labour he frequently does. Needless to say none of these explanations would apply to the young child. So little is known about immunity that one hesitates to hazard even a guess, but the well known fact that good nutrition increases our resistance, would suggest that possibly the female has the advantage, because she is essentially anabolic while the male is katabolic. At any rate in the earliest struggle for life she seems to have a definite advantage both prenatally and in the early years.

It is interesting to note, also, that all forms of congenital malformation are more common in the male. These have usually been explained as either due to an arrested development, or to an injury during the prenatal period. If due to the former then preponderance in the male is hard to explain except by the theory that the male is a more complex species, and therefore more subject to faults of development. There is one so-called congenital anomaly of special interest to pædiatrists because it challenges our ability to handle difficult feeding cases. How can one account for hypertrophic pyloric stenosis occurring about four times as often in the male as it does in the female? Certainly the explanations previously given are inadequate to account for this anomaly. The suggestion that it is due to one of the internal secretions is plausible, but we must admit that these endocrine disturbances are more common in the female throughout life. Can there be any association between this condition and gastric ulcer, which is found in about the same proportion in the adult male as pyloric stenosis is in the male infant? The immediate success of the surgical treatment of the latter, with no recurrence, is very much against the endocrine theory, as the operation only removes the result. If we can imagine the sex factor as the only one at work before birth this objection would not apply.

The frequency of chorea in females suggests that something more than a susceptibility to an infection is present. There must be in addition some organic weakness or functional tendency closely connected with sex, that permits the development of this affection by the causative agent of rheumatism. Otherwise we would see cardiac disease occurring in the female with as great a relative frequency as does chorea.

Goitre is *par excellence* a disease associated with sex by those who narrow their definition of sex to only that phase of it which deals with reproduction. Coming on as it does when puberty approaches, it afflicts the female right through her reproductive life, and the malignant varieties occur in the proportion of about seven or eight females to one male. In addition, physiological changes in size occur during pregnancy and during the menstrual period. The benefit derived from the administration of iodine makes this problem largely a nutritional one, and shows that the female requires more iodine than the male.

The psychoanalysts have made an important contribution to our knowledge of the relation between sex and psychology. The first contribution to this side of the question was made by Sigmund Freud* of Vienna in 1895. He developed his views from the study of neurotic patients. He found that if his patient took symptoms or dreams as starting points it was possible through the process of free association to bring into consciousness the forgotten experiences of early childhood. Freud found that this method led to the revelation of certain sexual facts in childhood, which when recognized and treated, lead to the removal of the patient's symptoms.

Alfred Adler of Vienna studied under Freud, but later developed his own system of individual psychology. He puts the main emphasis on the ego instincts instead of the sex instinct. The predominating interest of life according to him is not the sex instinct, but the wish for power and the wish for security.

* For a full account of Freud's views the reader is referred to an excellent paper by Dr. Bridges on "Psychoanalysis" (*Public Health Journal*, June, 1923), from which this summary has been taken.

To be able to follow Freud, and the others of his school, one must observe the facts in childhood, which although masked he claims to be present. The difficulty here is extreme and seems insurmountable to the adult as our early years are a blank to us all. Doubtless in some cases, the child goes through many conflicts during his early training or moulding period. This is the important period for making adjustments; unfortunately, the ordinary parents have little knowledge of child life and child psychology. It is to the physician that they naturally look for information, but unfortunately too often he knows even less than the anxious parent. Physicians should acquire sufficient knowledge of facts connected with the development of sex in children to be able to guide parents and prevent them falling into the hands of insufficiently trained people who may give a very one-sided view of the problem, and whose knowledge is insufficient to link up the mental with the physical. It should be our duty to exercise due conservatism, while at the same time we keep the public informed as to what is sound and useful in the many theories now being enunciated in the name of sex.

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(1) THOMAS, W. J., *Am. J. Sociology*, July, 1897. (2) JORDAN, H. E., *Am. J. Anat.*, 1922-23, xxxi, 27. (3) HAVELOCK, ELLIS, Man and woman, 5th edition. (4) ABT, System of pædiatrics. (5) CREW, F. A. E., Animal genetics and the science of animal breeding. (6) BRIDGES, J. W., Psychoanalysis, a contribution to the new psychology, *Public Health J.*, June, 1923.

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**Effects of Diet During Pregnancy on Development of Rickets in Offspring.**—J. Victor Greenebaum, Theodore K. Selkirk, Florence A. Otis and A. Graeme Mitchell, Cincinnati, present the results of their study of the effects of actively regulated diets of pregnant women on the development of rickets in their offspring. Twenty-five pregnant women who previously had had rachitic children were the basis of study. These women were studied in two groups over a period of eighteen months in order to include both winter and summer seasons. Only mothers apparently physically normal and promising to co-operate were chosen. A number of control cases were studied in the same manner. At the end of the observation period, the experiment or supervision period began and continued approximately throughout the last three months of pregnancy. During this time the mothers' diets were supplemented by vegetables, cereals, fruit, eggs and milk, the endeavour being to bring the daily food intake up to the proper standard for pregnant women. The standards sought were the daily ingestion of food containing 1 gm. of calcium, 1.45 gm. of phosphorus and 0.015 gm. of iron, and having the equivalent of 2,500 calories. These experiments would indicate that if the diet of the mother during the last three months of pregnancy can be made approximately correct in caloric and mineral intake, while it will not prevent rickets, it will have a controlling influence on the development of the disease in her offspring. A control series of twenty-five infants of the same age and social status for whom cod liver oil was ordered as a routine was also studied. One hundred per cent of these were found by Roentgenographic examination to have rickets by the eighth month. The average daily calories in the antepartum diets of the mothers whose infants developed moderate and marked rickets were, as a group, lower (average, 1,490) than in the group whose infants developed mild rickets (average, 1,707). In the entire series, regardless of the degree of rickets, the mineral intake of the mothers was approximately the same. In the cases in which blood examinations were made, the inorganic phosphorus content of the mothers' serum, obtained in the antepartum period, was uniformly normal, while the inorganic phosphorus content of the babies' serum was below normal. The calcium content of both mothers' and babies' blood serum was normal. Frequently a low calcium content of the breast milk was found, possibly the result of the inadequate diets of the mothers during the lactation period, since practically all of them returned, during that period, to their previous habits of eating, consuming a diet in which milk especially was lacking. The inorganic phosphorus of the breast milk was uniformly normal. The season of the year in which the babies were born apparently had no influence on the degree of rickets found, although the series is too small to make this statement of any significance. The incidence of rickets in this series of twenty-two babies to whom cod liver oil was not given was as follows: By the eighth month, sixteen of the infants showed rickets on clinical examination (73 per cent) and nineteen showed rickets by Roentgenologic examination (87 per cent).—*J. Am. M. Ass.*, Dec. 11, 1926.

# New Instruments and Technique

## ELECTRO-COAGULATION AS AN ADJUNCT IN TONSIL DISSECTIONS*

By W. H. Taylor, M.D.

*St. Mary's, Ont.*

RECENTLY the writer has enucleated tonsils, using electro--coagulation to secure hæmostasis, with gratifying results.

The special scissors he has had made for the purpose present the following features: (1) The blades are short,—about half an inch long; they are set well in advance of the pivotal joint; the shanks of the scissors between the blades and the joint are out of contact with one another; and the blades with the shank portions immediately behind them are curved for tonsil work. (2) With the tips of the blades exactly in contact, the blade edges diverge from one another to form a very narrow V, opening backward; the blades of these scissors being designed to shear from before backward. (3) Each half of the scissors is insulated from its fellow at the joint by the interposition of Bakelite between them; a disc of Bakelite intervenes also between the flat head of the centre-pin and the underlying surface of that half of the scissors; and a tube of Bakelite surrounds the centre-pin.

Thus, when each side of the scissors is connected at the handles with one or other of the terminals of a high-frequency machine, the space between the blade edges constitutes a spark gap, which may be opened and closed by opening and closing the scissors. Of course, the current will spark at the joint if its intensity is unduly increased; but the requirements of electro-coagulation do not call for such intensity of current. Besides, the path of lesser resistance lies between the closely approximated blades, and through the tissue which is held by their edges.

Hæmostatic preparation of tissues prior to cutting them is the outstanding feature of the method. Otherwise, the technique does not differ materially from that of ordinary tonsil dissection. The mucous membrane covering the pillars is first of all divided. This does not require coagulation, since bleeding from this source is negligible. The tonsil is drawn forward and, one after another, each band of tissue between the pharyngeal wall and the capsular membrane is grasped between the scissor blades and coagulated; the current being controlled by a foot-switch; and along the line of coagulation each bite of tissue is severed by closing the blades.

In this way the dissection may be carried out bloodlessly; or with no more bleeding than is incidental to the incision in the mucous membrane, or to the separation perhaps, of a piece of friable tonsil in the teeth of the tonsil-holding forceps. The use of the snare is dispensed with, since the tonsil is severed, in the same bloodless manner, at its base.

Not the least of the advantages afforded by this method is the visibility of the structures dealt with, due to the unaccustomed dryness of the operative field.

It is not improbable that this principle may be extended with advantage to other operative procedures (prostatectomy for instance) which necessitate the division of blood vessels in situations not easily accessible to ligature; for, whatever may be cut with scissors may be dealt with in this way, the destruction of tissue being confined to the pathway of the endothermic current which lies between the scissor blades.

* Received for publication Jan. 6, 1927.

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# Case Reports

## HEREDITARY DIABETES INSIPIDUS

By Lillian A. Chase, B.A., M.B.

*Regina, Sask.*

The following case of diabetes insipidus is of interest because the disease can be traced through five generations.

*Case history.*—Mr. D.W.S., age thirty-six, white, single, on June 21, 1925, complained of being run down and tired.

*Personal history.*—Born near Linsday, Ont., had worked in northern Ontario hunting and prospecting; was a conductor on the Canadian National Railways for a number of years. When seen was driving a bakery wagon; this necessitated rising at 4.30 a.m.

*Present illness.*—Had excessive thirst and frequency all his life, but this did not trouble him until 1923 when he was knocked off a car injuring his leg. While he was in hospital at this time diabetes insipidus was diagnosed; since then he had been getting gradually worse. He drank about four gallons a day. His tongue got dry and thick if he went without water. He complained of never getting a good night's rest owing to thirst and frequency. He had lost about six pounds in the last month. Complained of sour regurgitation; had five or six bowel movements daily.

*Past illnesses.*—Tonsillitis twice a year for the last ten years. Swollen knees three years ago. Injury through fall two years ago.

*Physical examination.*—Weight 164 pounds; height five feet eight inches. -Patient was fairly well nourished, pale, lips bluish, eyes reacted to light and accommodation; eye grounds slightly pale, otherwise normal. Teeth in poor condition; many filled. X-ray showed focal infection at several of the apices. Tonsils hypertrophied. Posterior cervical glands palpable. Thyroid not enlarged. Cardio-vascular system, both margins of the heart exceeded normal limit, the left was 16 cm. from midline in fifth interspace, rate 48, inspiratory irregularity. Blood pressure 100 systolic, 70 diastolic. Lungs normal. Liver palpable four inches below costal margin. Spleen not palpable. Bowels distended, no fluid in abdomen. Reflexes easily elicited. Secondary sex characteristics all present.

*X-ray of head.*—(Dr. C. M. Henry). Lateral view: cranial cavity appears clear. No evidence of mass tumour. Sella turcica appears normal in size and shape.

*Laboratory.*—Amount of urine in twenty-four hours 12,000 c.c. sp.g. 1.002. Albumen negative. Fasting blood sugar .095 per cent. Blood urea 18.6 mgs. per 100 c.c. Blood enumeration, white blood cells 12,000; polymorphonuclears 45 per cent; lymphocytes 45 per cent; transitionals 7 per cent; eosinophils 2 per cent; basophils 1 per cent.

*Treatment.*—Pituitrin was given to check the thirst and heavy powders for the regurgitation, but he was not a faithful patient. He reported for only six hypodermics of pituitrin in July and six in August. Early in September he gave up his work of driving the bread wagon. On September 9th he complained of swelling about the internal border of the patella, without heat or redness. This disappeared after short rest in hospital, pituitrin and diathermy.

*Progress.*—On discharge from hospital he undertook the duties of night clerk in a hotel, but found the work too heavy, gave it up and went to northern Ontario. The winter of 1925 he spent hunting. The summer of 1926 he ran a motor boat on Lake Abitibi. As soon as he began to live a more outdoor life he began to improve. He took pituitrin occasionally. On August 31, 1926, he wrote that he was feeling well and weighed 173 pounds, that is, a gain of nine pounds in a year. His last dose of pituitrin had been five months previously in March, 1926.

Fig. 1 shows influence of pituitrin on the output and sp.g. of urine. Fig. 2 shows the influence of pituitrin on blood pressure and pulse rate. These observations were taken a number of times after the injection of pituitrin and without exception there was a transitory rise in blood pressure and pulse rate. This is

Montreal General Hospital by Mills,[1] who got contrary to the finding reported from the a lowering of the blood pressure in diabetes insipidus after injection of pituitrin. Fig. 3 shows the influence of pituitrin on the daily output of urine.

*Family history.*—The facts known are: the patient inherited the disease from his paternal great grandmother. His great grandmother and great grandfather are designated as generation I, it is not known how many there were in generation II, nor how many were affected.

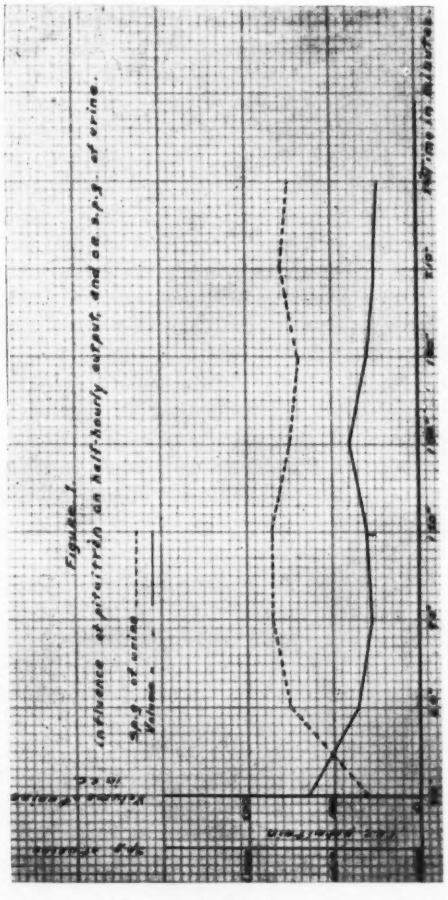


FIG. 1.—Influence of pituitrin on half-hourly output, and on s.p.g. of urine.

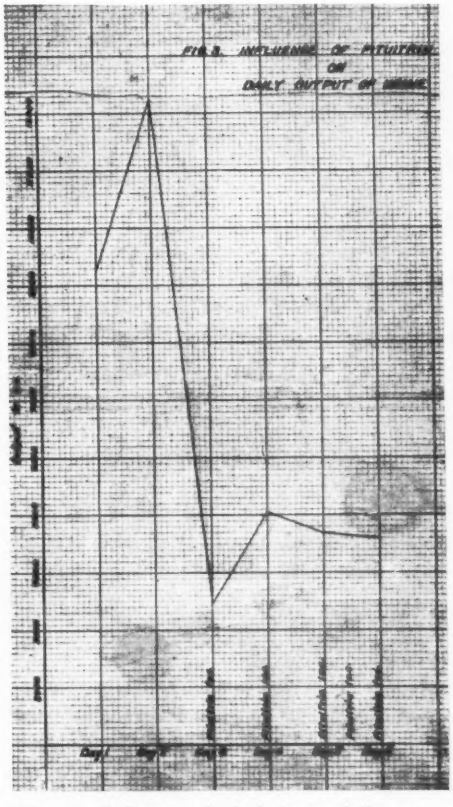


FIG. 3.—Influence of pituitrin on daily output of urine.

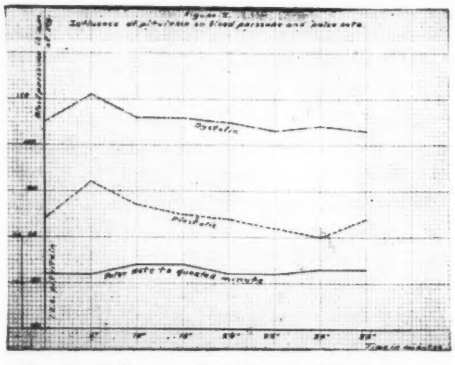
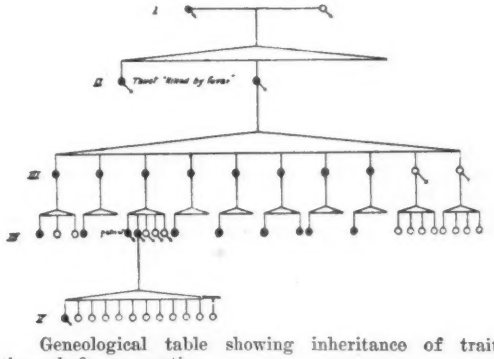


FIG. 2.—Influence of pituitrin on blood pressure and pulse rate.



Geneological table showing inheritance of trait through five generations.

In generation III there were ten members. Of these, one male and one female were not affected, nor were any of their children. In generation IV it is known that there are at least ten out of twenty-three children affected; probably more, as it is not known how many are not affected. The patient has one brother and two sisters not affected, and one sister affected. This sister has twelve children, and of these one is affected.

The following is a letter received from the patient's uncle now living in British Columbia. "The drinking of large quantities of water is inherited from grandmother on my father's side. My father was a very heavy drinker, also one of his sisters, until she had a fever that seemed to have killed the thirst. There were ten in our family; all drank large quantities of water, but myself and one sister. None of my family or that of my sister has the habit. Out of twenty-three in the next generation there are twelve water drinkers that I know of, and there may be more, as we are scattered over the world. I never knew any of them to have any trouble set in from drinking large quantities of water. Father would drink a gallon without taking the pail from his lips, he was a strong, healthy man until a short time before his death in his eighty-fifth year. I am surprised that my nephew has had to have treatment for his condition. You speak of a case near Montreal that may have been a relative as father's people came from that province."

The disease can be passed on by either father or mother to either daughters or sons, therefore, it is not sex-linked. Since unaffected parents do not pass it to their offspring the disease is not recessive, therefore, the disease in this family is dominant and not sex-linked.

*Summary*

A case of diabetes insipidus is described which showed satisfactory improvement, possibly due to the action of pituitrin, more probably to an outdoor life.

The disease, traced through five generations, is shown to be dominant and not sex-linked.

REFERENCE

(1) MILLS, E. S., *Canad. M. Ass. J.*, xv, No. 4.

## DIABETES IN A CHILD THREE YEARS OF AGE*

By R. P. SMITH, M.D.

*Hamilton, Ont.*

The prognosis in juvenile diabetes up to a few years ago was always very grave. Van Noorden was extremely pessimistic but the outlook was somewhat better when Allen elaborated and presented his work. One's vision became much better after Banting discovered insulin in 1922. The previous editions of text-books on pædiatrics accorded very brief space to this disease. Today volumes are written, so much so that the current medical literature, as well as the latest editions of text-books, contain many references to different phases of the condition, the deductions being the outcome of observations resulting from the discovery of insulin. The presentation of this case report and the problems that arose during the illness of this particular patient has been simplified to a great extent by knowledge gleaned from two papers by Dr. Gladys Boyd of Toronto, both of which are recorded in the transactions of this society. One is impressed by many immature conclusions of diabetic therapists contained in great masses of current literature as compared with the sane deductions of those who really have studied the disease. This is especially true in speaking of adult cases and one is further impressed by the apparent paucity of articles with reference to juvenile diabetes. Today those of us working outside larger centres on a much smaller scale must obtain our information from reports and observations as recorded in the literature and therefore one is greatly impressed with the two papers mentioned above.

This girl, D.D. came under observation in September, 1925, as the result of a request for consultation on a patient suffering from pyelitis. No history at that time brought out these facts. She was apparently well up to the third week in August at which time the parents noticed she was very irritable and the nocturnal enuresis which had been present for some considerable time became worse. Then she began drinking great quantities of water and at the same time diurnal enuresis developed. She was then confined to bed with fever and also for the preceding two weeks before admission to hospital. She had apparently lost a great deal of weight. Pus was

*Presented at Canadian Society for study of Diseases of Children, Gananoque, June, 1926.

present in the urine and she was under treatment with potassium citrate but she did not respond as had been expected.

On examination she was very pale and her general condition showed the musculature to be very flabby. She appeared to have lost weight recently. Her temperature was 102.5°F. She was well developed for her age. She had a marked stomatitis with small ulcers covering both lips. The source of this infection apparently came from the four upper incisor teeth which were nothing more than stumps with a severe pyorrhœa and apical abscesses. She had a very severe vaginitis with profuse purulent discharge. All the other organs were negative; no pathological conditions were found. An examination of the urine to confirm the diagnosis revealed not only great quantities of pus with marked albuminuria but four plus sugar with acetone and diacetic acid in great quantity. She was admitted to the hospital and her blood sugar was 0.362. Twelve hours after admission she showed signs of becoming comatose, with pain in abdomen and drowsiness. Insulin was given every hour until symptoms were relieved and the blood sugar came within what one would consider normal range. On a basal diet for her weight—twenty-six lbs.—with protein twenty-four grammes, carbohydrate twelve, fat forty-eight, it required twenty units a day for her to handle the diet and be sugar free in the urine.

The history showed that there was no hereditary predisposition diabetes, both parents being healthy, nor was there any such disease known in any preceding generation on either side. Outside of two acute infections as an infant, one of otitis media and one of chickenpox, she had been perfectly well. Her brother who was healthy was killed by an automobile. Clinical examination revealed the fact that there was great pain during the act of micturition. The diagnosis of diabetes mellitus with infection was made, the infection being manifested by a stomatitis and a gingivitis caused by infected teeth, with an accompanying pyelocystitis and vaginitis.

The progress of the case is best shown by a graphic chart outlined on the lantern slide. A study of this chart will demonstrate some of the problems that occurred during treatment. While four curves are shown, the food in calories, the weight in pounds, the insulin in units and the blood sugar in milligrams, it does not show the temperature curve, the presence of sugar or acetone in the urine or the food in grammes.

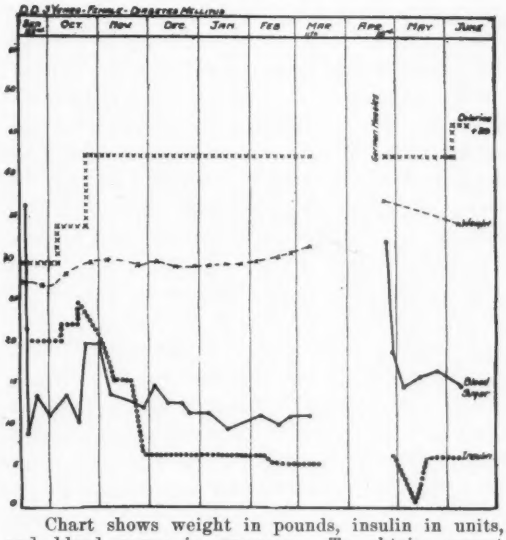



Chart shows weight in pounds, insulin in units, and blood sugar in grammes. To obtain correct number of calories multiply by twenty.

The temperature curve fell to normal from 102° by lysis in twelve days. During that time she received alkaline treatment for the pyelitis. The procedure adopted as to dietetic measures and insulin injections in comparison with the amount of sugar in the urine was to allow the patient to show no acetone or but very slight traces on occasions, and to show occasional traces of sugar in the urine. In other words one attempted to keep near the border line and one felt more safe in finding an occasional trace than to see none whatever—a diet of P.33. C.21. F.48, or equivalent to 810 calories, was considered to be sufficient to maintain growth. This was given with a corresponding increase in insulin. At this time the patient's general condition was much improved probably due to the treatment of the pyelitis. In October with the general improvement, and in spite of a rise in the blood sugar curve it was decided to reduce the insulin, the patient showing repeated signs of an overdose as evidenced by profuse perspiration and restlessness. This was followed by a slight drop to within normal levels of the blood sugar so that by the end of November she was taking seven units a day with the diet at the same level. During December and January nothing was altered. The holiday season with the accompanying excitement was probably responsible for an increase in the amount of sugar in the urine, but not sufficient to indicate interference in the line of treatment. In February a further reduction of two units per day was made but beyond this

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point one could not proceed without the urine showing large amounts of sugar. On March 11th, she developed German measles and to clear up the infection in the ward, she as well as other patients was sent home. She was re-admitted on April 23rd, when her blood sugar was 0.328 according to the laboratory reports. During the time out of the hospital the same diet and amount of insulin was given to the patient. This blood sugar of 0.328 was estimated by an assistant and one is inclined to disbelieve the report as next day the report shows 0.19 with no alteration in treatment. An attempt was then made to see if she would handle the diet without insulin and while a reduction was made to two units it was necessary to again increase to eight units. During May and June six teeth were removed, with no untoward symptoms, and an attempt in June to increase the diet again without a corresponding increase in insulin met with failure. This was prompted by the decrease in weight during the last six weeks as shown on the chart.

At present this girl is in excellent condition, eats well, is happy and plays around the ward of the hospital. Her home conditions have improved so that she may be discharged at any time.

On reviewing the progress of this particular case the following three questions arise in one's mind.

*First.*—While there was evidence of infection before diabetic treatment was instituted was the infection the cause or a coincidence?

*Second.*—Taking into consideration the marked drop in the insulin curve with little or no disturbance in the blood sugar, a satisfactory rate of increase in weight and with the diet maintained on the same level, would it be safe to presume that this was clinical evidence of pancreatic regeneration?

*Third.*—Bearing in mind the difficulty in estimating a definite prognosis, would one dare express the hope that this patient would progress to such an extent as to be insulin free, provided rational supervision of her treatment was exercised?

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## LUNG STONES (PNEUMOLITHS) POSSIBLY ASSOCIATED WITH TUBERCULOSIS

By F. H. Pratten, M.B.,

*London, Ont.*

This patient has complained of undue fatigue over an indefinite period. Three years ago she coughed up a small lung stone, and for two years, much persistent wheezing, accompanied by a dry cough and dyspnœa on exertion, has been present. During this time her weight dropped from 155 pounds to 137 pounds. Six months ago she had scanty purulent expectoration in the morning which has increased during the last two months. Two months ago the sputum was streaked with blood for two weeks and then after a severe paroxysm, she coughed up a second lung stone the size of a marble.

Her father has a chronic cough. One paternal uncle died of pulmonary tuberculosis in the patient's home when she was two years of age and another paternal uncle now has tuberculosis. Her past illnesses include measles, pertussis, influenza, tonsillitis, and laryngitis every winter.

Examination of her chest revealed only moderate impairment of resonance in the extreme bases posteriorly with a few superficial or pleuritic crepitations in the left base anteriorly. One sputum analysis was positive. Stereoscopic x-ray examination showed that there was a well marked suggestion of a woolly infiltration from the apex of the right lung to the fourth rib anteriorly. There was a linear area of consolidation in the region of the lower interlobe, and there may have been bronchiectatic dilatations in the base. The bronchial tree shadows on the left side appeared rather heavy and woolly without definite localized opacities. There was also a suggestion of bronchiectatic dilatations in the base. The radiologist concluded that the right upper lobe should be regarded with suspicion from the standpoint of tuberculosis.

### *Summary*

Since the uncle was ill for a long time and died in the home when the patient was only two years of age, gross exposure doubtless took place. The lung stones which she has coughed up on two occasions are probably calcified glands, the result of the old healed childhood infection. The fact that they have loosened and have been brought up indicates that softening and disintegration of the surrounding tissue, in all probability due to tuberculosis, have occurred.

The unexplained loss of nearly twenty pounds in weight in the last two years, the

persistent fatigue, cough and sputum, the x-ray findings and the occasional slight elevation of temperature point strongly to the presence of a low grade tuberculous lesion. (*Bulletin Harvey Club*, London, Ont., Oct., 1926).

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## A DICEPHALOUS FŒTUS

By Arthur O. Rose, B.A., M.D., and Crawford Rose, M.D.

*Hafford, Sask.*

On November 5, 1926, at 4 p.m. an immigrant woman living sixteen miles from town came to the hospital to ascertain whether she was in labour. Finding that labour had already set in, she decided not to return home, but to put up in town and employ the ubiquitous mid-wife.

At midnight she was brought to the hospital in an exhausted condition, still protesting that she was not in labour, and refusing any intervention. Upon examination, however, we found the cervix fully dilated, and the brow presenting, so, much against her will, the woman was anæsthetized and the head brought down.

To our surprise no further progress could be made, and then one of us discovered that we were dealing with an irregularity, suggestive of interlocked twins. Careful vaginal examination revealed a second head, attached to the opposite shoulder of the same body. All efforts at dismembering the fœtus were ineffectual, and it was feared that decapitation and delivery by podalic version might not only prove equally fruitless, but result in fatal hæmorrhage. Cæsarean section was therefore performed, with decapitation of the already delivered head, at 3 a.m.

The patient ran an elevation of temperature for three days, with a rise to 102° on the fourth. To our relief the temperature dropped on the fifth day, and the woman has made an un-interrupted recovery.

The specimen is a nine-pound typical dicephalus, with two well formed heads set wide on the shoulders of an apparently normal body. Statistics give an incidence of one in 17,600.

The specimen has been preserved in the Medical Museum of the University of Saskatchewan at Saskatoon.

## CASE OF HYPSILOID (DICEPHALUS MONOSOMUS)

By Harold Morison, M.D.

*Dryden, Ont.*

Mrs. M., Italian, aged twenty-nine years, primipara. Family history interesting, owing to the fact that the patient's mother was confined with twins three times. Patient herself was not a twin.

Patient was not seen by any doctor until she was well on in the second stage of labour. On external examination it was thought that two heads could be palpated, but only one set of limbs, and only one heart sound could be heard. Patient was a large woman with a pendulous abdomen rendering any definite external examination difficult.

The head presented in the L.O.A. position, and the patient made good progress until the cervix was well dilated; thereafter further progress ceased. As I had no competent assistance and no one who could understand English, I administered an anæsthetic, confirmed my diagnosis, applied instruments, and delivered the head without great difficulty. I found further delivery of the body impossible.

I then called a trained nurse who gave an anæsthetic and on making an examination I came

to the conclusion that I had a case of a double monster of one of two types, chioid or hypsiloid. The patient was removed to the hospital, and on arrival I found the uterus in tonic contraction, a Bandl's ring being quite evident. The patient was immediately anæsthetized and placed on the operating table, the clavicle and upper ribs of the fœtus were then severed sufficiently to admit the hand: the fœtus was eviscerated allowing the thorax and abdomen to collapse. The lower limbs were then delivered and the second head was delivered without difficulty as in the case of a breech. A very marked laceration of the perineum resulted, which was carefully sutured, and subcutaneous salines in large quantities were administered. The patient made a good recovery though still confined to bed at the writing of this paper two weeks after delivery.

The placenta was quite normal. Weight of fœtus after evisceration was thirteen pounds.

## DELIVERY OF SYNCEPHALUS THORACOPAGUS

By Ross Mitchell, M.D.,

*Associate Obstetrician, Winnipeg General Hospital*

Mrs. G., admitted to Winnipeg General Hospital under the writer's care, September 24, 1925. Para 1, gravida 2. Last menstrual period February 20, 1925. Had attended prenatal clinic of Winnipeg General Hospital regularly. In her previous pregnancy she had vomited at intervals throughout whole period of pregnancy. The labour and puerperium were normal.

During her present pregnancy there had been no vomiting, but frequent headaches; no œdema. Nothing abnormal was noted except that fœtal movements were not felt until August, the sixth month.

On admission the membranes were intact; pains, five minutes apart, strong and the contractions good. Limbs felt at right side. Membranes bulging through partially dilated os.

After eleven hours labour the os was fully dilated and pains were almost continuous and severe. The membranes were ruptured artificially and a large quantity of fluid escaped. A small head presented, and with one severe pain the bodies were born. Limbs moved actively and heart beats were visible. A few gasping respirations followed. Heart beats continued for ten to fifteen minutes then ceased. Weight of monster four and one-half pounds. There was only a single cord and placenta. The accompanying illustration is taken from a post mortem x-ray. There were four arms and four legs. The bodies were united at the thorax. The single head was wider than a normal head, and though there was only one set of features there was evidence of two heads being fused. Dr. G. G. Leckie was in attendance at the time, and Dr. S. E. C. Argue wrote the history.

*Note.*—This case and the one preceding are examples of double monsters. They come from one ovum and are developed from one germinal vesicle. The etiology is unknown. The one first described belongs to the class *terata katadidyma;* the fission being from above downward; the second to the class *terata anadidyma,* the splitting being from below upward.

## ECHINOCOCCUS CYST OF THE OMENTUM

By R. P. Reynolds, M.D. and J. A. Ferguson, M.D.

*London, Ont.*

*Case history.*—Mr. T. P., a labourer, aged twenty-nine, complained of a persistent pain

over the whole abdomen. This as a rule was very slight, but at intervals the pain became very severe and was of a colicky nature. During the last six months the pain had become more severe, and the attacks of colic more frequent. The patient had had hæmoptysis on two occasions. He was troubled with constipation but had never been nauseated, or vomited.

Physical examination revealed a thin, well developed adult, who seemed to be in no special discomfort. The abdomen was slightly distended, more so in the lower half. There was no hyperæsthesia or rigidity present. On deep palpation a mass the size of an orange could be felt in the left lower abdomen. Rectal examination revealed pressure from this mass. It did not involve the mucous membrane. This mass was immobile and was attached to the pelvic wall. A second mass could be felt below McBurney's point. This was movable in all directions and was very tender. A third mass was palpated just below the tip of the ninth rib on the right side. There was no palpable adenopathy of the inguinal, cervical or axillary lymph glands. Radiographic examination showed these masses to be pressing on but not actually involving the intestines.

A blood count revealed 5,150,000 red and 15,000 white corpuscles. The differential count gave 17 per cent small lymphocytes, 7.5 per cent large lymphocytes, 29 per cent polymorphs and 1.5 per cent eosinophils. The Wassermann reaction was negative. The patient was discharged from the hospital without a diagnosis.

This patient was seen monthly at the surgical out patient clinic, and an increase in the size of the abdomen was noted, together with cachexia, anorexia and emaciation. A provisional diagnosis was made of a slow growing tumour probably of a malignant nature. On March 21, 1925 he was seen at his home, suffering from partial intestinal obstruction and was immediately sent into the hospital.

Five days previous to admission, patient noticed that the urine was streaked with blood, and for the past seventy-two hours there had not been a bowel movement. His temperature was 99,° pulse 92, respiration 24. He was nauseated but there had been no vomiting. The abdomen was markedly distended and very rigid. High colonic irrigations relieved the obstruction, the abdomen became soft and the tumours were easily palpable. Cystoscopy revealed many large varicosities in the vault of the bladder, which probably accounted for the blood in the urine. The ureter and the bladder were displaced to the right of the mid-line, thus showing pressure of a large mass from the left side.

It was decided to perform a laparotomy and relieve the obstruction. The lower mid-line incision was used. Two small cysts in the omentum were ligated and removed. The large cyst in the left lower quadrant was six inches in diameter and felt rubbery. It was adherent to the bladder in front and to the rectum behind. The omentum surrounded it, thus revealing the origin of the tumour. It was ligated and dissected away from the bladder and rectum and during this operation the cyst was unfortunately ruptured but the abdomen was well walled off with packs. Another cyst in the region of the cæcum was removed. At this stage the liver was carefully palpated and two small areas seemed to suggest some firmness but no definite nodule could be made out.

The patient was quite ill following the operation, but gradually improved and left the hospital well, nine weeks after the operation. It is fifteen months since he was operated upon and he is now apparently in excellent health, feeling quite well and doing heavy manual labour. There are no signs of liver involvement

FIG. 1.—This picture shows three of the four cysts removed. They are about two-fifths actual size, and are formed of the usual laminated or chitinous membrane which is lined by the granular or germinal membrane from which the worm buds grow. The cysts are enclosed by a dense fibrous capsule which results on account of the tissue reaction to the cyst. The membranes of fibrous capsule are of considerable thickness, averaging about 4 mm. These cysts possess one large cavity into which the germ buds grow; (endogenous proliferation).

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yet. This fact also strengthens the supposition that the liver is negative, although L. Cevario reports a case that four years after apparently successful removal of omental cysts, showed involvement of the liver.

FIG. 2.—The photograph shows very clearly the new daughter cysts growing out from the lining membrane. Very small worm buds springing from the new daughter cysts are not shown in the photograph.

The microscopic examination of these cysts reveal the usual appearance. The largest cyst removed has a length of 12 cm. and a width of 8 cm. The smallest is 4 cm. by 3 cm. and the others range in size between these. These cysts are unilocular and belong to the group *tænia echinococcus unilocularis.*

*Discussion.*—Few cases of hydatid cysts are encountered in Canada. Primary hydatid cysts of the omentum are very rare. Hydatid cysts of the omentum secondary to hydatid cysts elsewhere in the body are more common. The case presented here is thought to fall in the first group because at operation no definite nodules could be palpated in the liver.

It is generally agreed that the embryo is set free in the upper gastro-intestinal tract. R. Aupois (*Paris Thesis,* 1902) believes that the embryo penetrates the mucous membrane and is implanted directly into the omentum, or the involvement of the omentum is secondary to spontaneous or traumatic rupture elsewhere in the body. In the majority of cases the liver is the primary site.

Primary echinococcal cysts of the omentum are considered to be quite rare. A. Aimes (*Les tumeurs du grand epiploon Progres med.* Par. 35: 1-6, Jan. 4, 1920) has collected thirty-two cases of primary hydatid cyst of the omentum and a large number of secondary cysts. It appears from this report that they are more common than they are generally thought to be. L. Cevario (*Su due casi di cisti da echinococco dell epiploon Gazz. de. esp.* 44: 603-607, July 1, 1923) reported two cases—one in which four years after apparently successful removal of the omental cyst, laparotomy showed the liver to be involved, with subsequent death of the patient.

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**Experimental Investigations on Convulsions.**—Experiments made by Walter E. Dandy, Baltimore, show that only stimulation of the motor cortex or its subjacent fibers (with the motor cortex intact) can produce clonic convulsions; that with the one motor cortex excised, clonic convulsions cannot develop contralaterally, and after the excision of the motor cortex of both hemispheres clonic convulsions have not again appeared regardless of the point of stimulation or the intensity of the stimulus. The cerebellum appears not to have any influence on the causation or prevention of clonic convulsions. It therefore seems safe to conclude that the motor cortex is alone responsible for the remarkable phenomenon of clonic convulsions. Doubtless this specificity of function similarly obtains in the human motor cortex, and is possibly a function of the pyramidal cells. One is not, however, justified from these experiments in saying that the attacks of epilepsy, of which the convulsions are a part, originate in the motor cortex. Clinical evidence, in fact, indicates that they may or may not begin there, depending on the location of the lesion in the cerebral hemisphere; but it is safe to say that without the motor cortex the convulsions could not develop. The point in the hemisphere at which the attack begins would appear to be revealed by a study of the epileptic aura when the affected area has a known function. For example, a gustatory or olfactory aura must be from a lesion of the uncinate lobe, a visional aura from the visual centre; a motor aura from the rolandic area, and so on. A stimulus of sufficient strength in any part of the hemisphere quickly brings the motor cortex into action, a convulsion resulting.—*J. Am. M. Ass.,* Jan. 8, 1927.

# Reviews and Retrospects

## SOME FUNCTIONS OF THE SPLEEN*

By Edward S. Mills, M.D., M.Sc.

*Montreal*

Perhaps there is no organ in the human body about whose function there has been more speculation, or upon which there has been more experimental investigation, than upon the spleen. When all this investigation is summed up, a huge amount of contradictory evidence is the result, though certain facts do stand out undisputed. We know that the spleen is an extremely vascular organ acting as a storehouse or reservoir for erythrocytes; that it is intimately concerned with blood destruction and, under certain circumstances, blood formation; and that it contains a considerable proportion of the reticulo-endothelial tissue of the body. Hence it is not surprising to find that important functions are associated with the activities of the reticulo-endothelium of the organ.

The relation of the spleen to body weight, to digestion, to metabolism, and even to immunity are, however, far from being settled questions.

### *Anatomy of the Spleen*

Not the least discussed subject has been the anatomy of the spleen. For this reason, and because it is of such importance from a functional standpoint, a few of the debated points may be recalled.

After Malpighi's discovery of the lymph follicles, and Ruysch's observation that the terminal arteries are end-arteries, little was added to our knowledge of the anatomy of the organ for nearly two centuries. Then arose a long discussion as to whether the circulation through the splenic pulp is by means of a closed system of capillaries, or whether the blood passes freely through the pulp spaces. Billroth[1] (1861) was the champion of the school who argued for a closed system, while W. Müller[2] (1865) opposed this view. Weidenreich[3] (1901), on the other hand, maintained that both types existed. This question was definitely settled by Mall[4] (1902) who demonstrated by experiment that the blood ordinarily passes into the pulp spaces lined only by reticulum. W. Müller had also shown that the terminal arterial vessels are surrounded by fusiform bodies—the ellipsoids. Into these cell masses the blood from the enclosed vessel was found to flow. In the course of an investigation during the past year, microphotographs were obtained of these structures and of the manner in which they empty into the pulp. It was found that the majority of the circulating fluid flows out into the ellipsoids through stomata in the wall of the enclosed artery. From the ellipsoid it spreads out into the pulp in all directions. The vessel may, however, pass through the ellipsoid to end blindly in the pulp beyond, though the flow is largely into the ellipsoid. In either event the blood enters the pulp spaces, from which it collects into the venous sinuses.

The fibro-muscular trabeculæ and capsule, as shown by Mall, divide the organ into compartments capable of tremendous changes in volume.

### *The Spleen as a Blood Reservoir*

In 1881 Roy discovered that the spleen possessed, in addition to a slow expansion and contraction, a more rapid systole and diastole, which normally occurs once per minute, and is independent of arterial pressure. It was not until recently, however, that the significance of this latter type of contraction was demonstrated by the Cambridge investigators under Barcroft[5] (1923). Animals were subjected to varying amounts of carbon monoxide gas. Samples of blood from the splenic pulp were found to reach any given concentration of carboxyhæmoglobin present in the peripheral blood, only after a definite delay. This delay was found to be greatly shortened by increasing the irritability of the animal or by manipulating the spleen, which caused a marked contraction of the organ. In cats it is estimated that one-third of the total number of red corpuscles in the organ may thus be expelled. Here then is a means by which nature may, in time of need, bring into action its reserve of corpuscular elements. That such a happening does take place was suggested by subjecting splenectomized guinea pigs to an

* Read before the Osler Reporting Society, Montreal, Nov. 26, 1926.

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atmosphere containing coal gas. The control animals survived in a concentration fatal to the others. It is also of interest in this connection, that marked contraction of the enlarged spleen in cirrhosis of the liver is reported frequently to follow gross hæmatemesis.

FIG. 1.—Vessel passing through ellipsoid. Photograph of stained specimen X 465.

The surviving spleen of a cat was perfused for a long time with Ringer. The vessel enters from above, and leaves below. Its course is traced by means of the long oval nuclei of the endothelium. While the vessel is continuous, its lining endothelium is discontinuous, suggesting perforations in the wall.

### *Spleen and Blood Formation*

It has long been recognized that in the mammalian embryo the spleen is a site of blood formation. Under pathological conditions and especially in severe anæmias, areas of myeloid metaplasia have been observed in this organ. If Sabin's view be correct, that erythrocytes arise from a primitive reticular cell, which she has demonstrated to be present in the spleen, it is surprising that hæmatopoietic areas are not more frequently found in this organ in some severe anæmias.

### *Spleen and Blood Destruction*

There are many experimental proofs to show that the spleen is actively concerned in the process of blood destruction, both in the normal animal and in pathological states. Ponfick[6] (1885) was the first to describe the phagocytosis of blood pigment, fragmented erythrocytes, and whole red blood cells, by the mononuclear cells of the splenic pulp. More recent experiments show that the erythrocytes are less fragile after splenectomy, while Mann (1925) and his co-workers[7] maintain that the bilirubin content of the splenic vein exceeds that of the splenic

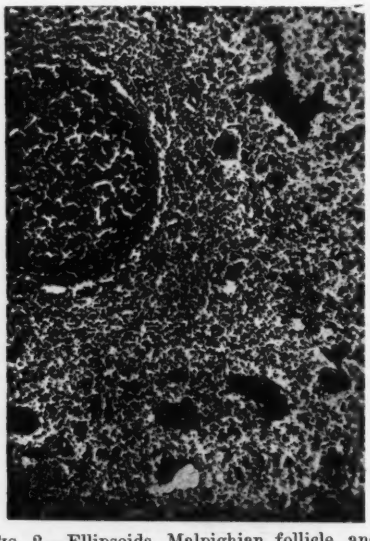

FIG. 2.—Ellipsoids, Malpighian follicle, and venous sinuses of cat's spleen. Photograph of stained specimen X 110.

The surviving spleen of the cat was perfused with Ringer by the artery to wash out blood and pulp cells. It was then perfused by the vein to distend the venous sinuses. Four ellipsoids are seen, one resembling a multipolar nerve cell. The small clear areas near the trabeculæ are the distended venous sinuses.

FIG. 3.—Extravasation of ink from ellipsoid in dog's spleen. Photograph of stained specimen X 405.

Surviving spleen of a dog was perfused with Ringer, then a dash of ink. The photograph shows the terminal vessel and the ellipsoid, with extravasation of ink into the pulp from the latter. The actual outline of the ellipsoid is not clear in this photograph, but is well seen in Fig. 4, which is a cross-sectional view from the same spleen.

artery. These different lines of investigation all lead to the conclusion that red blood cells are destroyed in the spleen.

Of interest in this connection is the anæmia which follows splenectomy. The conclusion of Krumbhaar's[8] experimental investigation is that the spleen produces an internal secretion which normally stimulates the hæmatopoietic function of the bone marrow.

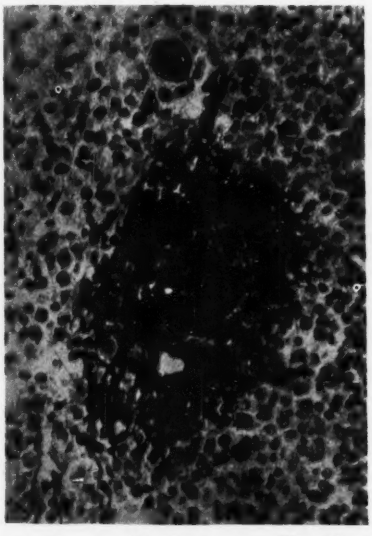

FIG. 4.—Cross sectional view of ellipsoid with extravasation of ink. Same magnification as Fig. 3.

The outlines of the ellipsoid at the centre of the photograph are well defined. The black circle at the top of the photograph is an arteriole filled with ink. The small clear space below the ellipsoid is an empty venous sinus.

### *Spleen and Immunity*

It has been recognized for a long time that the spleen is actively concerned in the process of immunity. Wyssokowitsch[9] (1886) was the first observer to point out that bacteria injected into the blood stream are caught and undergo phagocytosis by cells in the spleen. About the same time it was found that experimental removal of the spleen of certain animals is followed by a lowered resistance to anthrax and tetanus (Bardach,[10] 1889; and Tizzoni and Cattani,[11] 1892). A third line of investigation, begun by Cary[12] (1922), demonstrated that the spleen plays another defensive rôle—that of the formation of antibodies, and that this is a function of its reticulo-endothelium. Splenectomy was found by Bieling and Isaac[13] (1922), to be associated with diminished antibody formation, provided the reticulo-endothelial tissues elsewhere were first put out of action by a blockage experiment.

The author's investigation of the nature and function of the ellipsoids, throws light upon several phases of this question of immunity. In this study it was shown that a suspension of India ink injected into the general circulation of a cat, undergoes agglutination in the blood stream, the clumps thus formed coming to rest in the ellipsoids of the spleen. Here they at once undergo phagocytosis by the cells of the ellipsoid. When these cells become engorged with ink, they migrate to the pulp leaving only a fine reticulum to mark the position of the ellipsoid. What happens next, depends upon the amount of ink injected. After a large amount there may be no attempt at regeneration for weeks. With smaller amounts the ellipsoids are restored to integrity by division and growth of cells immediately about the vessel formerly enclosed—presumably the endothelium of this vessel. Second injections of ink during the regenerative period show that the cells at the periphery of the growing mass are the most phagocytic. After a suitable dosage of ink, the ellipsoids may not only regenerate but undergo marked hyperplasia, at times surrounding trabeculæ and filling the pulp spaces. This hyperplastic tissue is in all respects similar to the ellipsoids.

The ellipsoids were found to vary in size and development in different animals. In the cat and dog they are large and numerous, in man more rudimentary, while in the rabbit and guinea pig they are entirely absent. In the spleens devoid of these structures, phagocytosis takes place diffusely throughout the pulp of the organ.

It was thus established that the ellipsoids are the most active and important part of the reticulo-endothelial tissue of the spleen of many animals. As a result of their activity, bacteria and foreign particulate matter of other kinds are removed from the general circulation.

The demonstration that these structures undergo anatomical and functional hyperplasia goes far towards settling a question which is much debated at the present time. During the present year Jungeblut and Berlot[14] (1926) found that guinea pigs failed to develop an immunity to diphtheria after toxin-antitoxin

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injections, if they had previously been given a dose of India ink to block the reticulo-endothelium. With smaller doses of ink they obtained a similar result. Parallel figures were also obtained by Weiss and Kunze[15] (1925). At the same time however, Rosenthal[16] (1924) and Standenath[17] (1923) reported contrary results, and Loomis and Lewis[18] (1926) definitely showed that the antibody content of rabbit's serum increases after a suitable degree of infection by the bacillus tuberculosis.

As Sacks[19] suggests, these results are not so conflicting as they at first seem. It is only necessary to assume, in the one instance, that the injections produced a block in the reticulo-

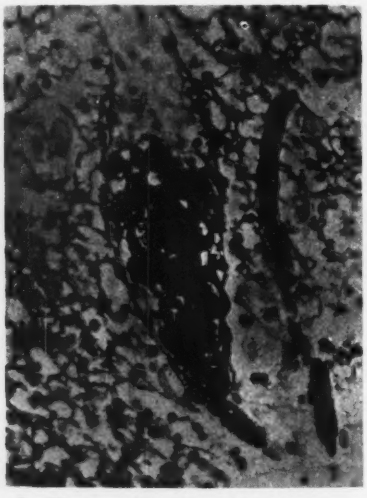

FIG. 5.—Human ellipsoid. Photograph of stained specimen X 405.

Spleen of a child dead from pneumonia. Obtained at necropsy. Technique same as for Fig. 2. Only the proximal half of the organ contains ink. The reticulum of the pulp is here rendered evident by adherence of the ink to it. Another small arterial vessel filled with ink is seen alongside of the ellipsoid.

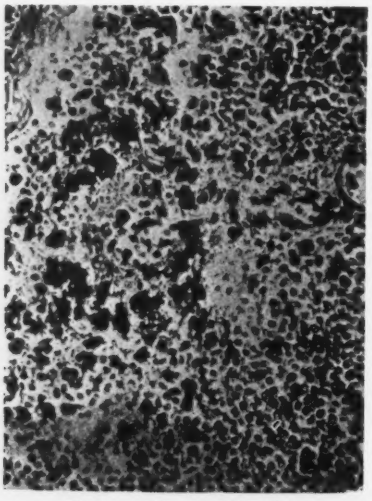

FIG. 6.—Former site of ellipsoid in cat's spleen. Photograph of stained specimen X 475.

Forty c.c. of ink was injected into the femoral vein. The cat died eighteen hours later. The terminal arterial vessel is seen coming off a larger vessel at the extreme right. The site formerly occupied by the ellipsoid is marked by the peripheral zone of ink-laden phagocytes, which have migrated outward from their former position. This is now occupied by a few red blood cells.

FIG. 7.—Hyperplastic ellipsoids in cat's spleen. Photograph of stained specimen X 102.5.

Hyperplasia was produced experimentally by one intravenous injection of thirty c.c. of ink eight days prior to the final dose of forty c.c. The animal was killed five hours after the second injection. The ellipsoids in this spleen were proved to be free from ink before the second injection, by means of a biopsy section. The degree of hyperplasia may be gauged by comparison with Fig. 8.

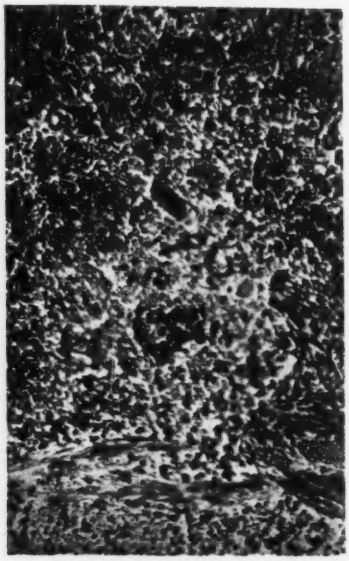

FIG. 8.—Photograph of ellipsoids containing ink, prior to experimental production of hyperplasia. Slightly higher magnification than Fig. 7, for comparison with it.

endothelial tissue, whereas in the other, it was spurred on to increased activity. These authors were in a way unfortunate in selecting rabbits and guinea pigs for their studies, because in these animals increased activity of this tissue can be checked with difficulty by histological studies. Our experiments show that in the cat at least, blockage or stimulation of the reticulo-endothelium of the spleen is largely a question of dosage and time. This explains the contrary results obtained by different observers, if we admit the legitimate assumption that this antibody formation is a function of reticulo-endothelium.

Recent experiments by the author tend to show that hyperplasia of the reticulo-endothelial tissue in the spleen of the cat may be produced by the injection of a suspension of *B. tuberculosis*, and that this hyperplasia is most marked at a time when, according to Loomis and Lewis, the antibody content of the serum is at its peak. Moreover Sabin[20] (1925) and her school have fairly well established that the monocytes, which are derived from a reticular cell, bear the brunt of the attack in tuberculosis, and that in this disease these cells undergo hyperplasia.

The immunity against tuberculosis conferred upon the animal presumably by the reticulo-endothelium and its derivatives is most strikingly exemplified by the reaction of laboratory animals to it. For instance, the cat and dog are with the greatest difficulty infected with the tubercle bacillus, while the rabbit and the guinea pig are most susceptible. The former animals have relatively large spleens with well developed ellipsoids, whereas in the smaller spleens of the latter animals, these structures are absent. This association may be only a coincidence but it suggests a definite relationship between the degree of development of the ellipsoids and the immunity of the animal to tuberculosis. It does not seem a far cry to the time when some experimental method will be devised for the production of immunity against tuberculosis and other diseases, to which the reticulo-endothelium and its derivatives form the major lines of defense.

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## ON HEADACHES

An interesting study on the symptomatology of headache appears in the September number of the *Glasgow Medical Journal*. The writer, Dr. Halliday, states that his observations were made while engaged in general practice which he regards as the best field for observation. It was found that all the headaches be examined had some features in common but varied much in position, nature, intensity and duration. All descriptions of headaches as bursting or splitting are of necessity vague, for pain is a primitive sensation and appears to be a function of the thalamus rather than of the cortex. If during an attack of headache pressure is applied to the points on the scalp where the cutaneous nerves emerge, certain of these points will be found to be tender, and useful information may be thus obtained. The following facts were noticed: one or more tender points were found in every case of headache while the attack was in progress, and the site of the headache was always found to centre round these tender points; the supraorbital nerves either singly or together were generally predominantly involved; although these emergence points are specially tender a much larger area of the scalp may also be tender though not so urgently so, as the emerging points. No particular cause seemed to be associated with any particular position of the headache, and the position may shift from back to front or from side to side during the existence of the attack.

Two main groups of causes may be supposed to produce headache, namely, toxic causes and referred causes. In the toxic group we would specially mention the tendency to headache in influenza. Of the referred causes, neurasthenia and eye strain are perhaps the most important. Associated with headaches in many instances may be noted a definite alteration in cutaneous

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sensibility, which in the majority of cases was of the nature of an over-reaction to painful stimuli, such as a slight scratch with a pin point and a diminished reaction to tactile stimuli, such as a brush with a pledget of cotton wool. In some cases an intensification of the pain may be induced by pressure over more distant areas. An illustrative case is quoted in which a girl of fourteen years, suffering from a gumboil in the right lower jaw complained of severe headache. Both supraorbital points were unusually tender as was also exit of the right temporal and during the routine examination an acute thrill of pain was complained of when pressure was made over the points of exit of left mastoid, the right lesser occipital and the right supraclavicular nerves. Care had been taken to avoid any suggestion.

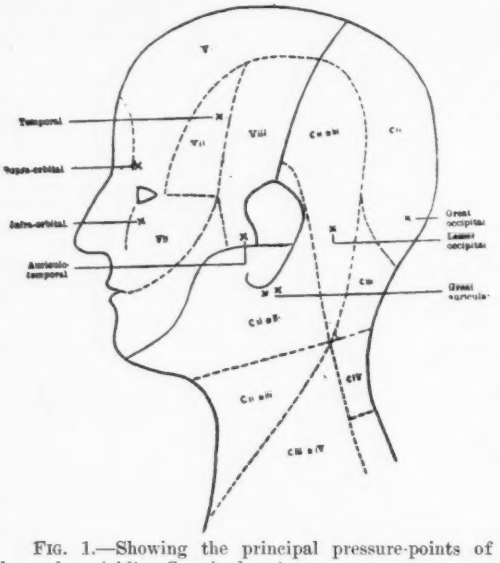


FIG. 1.—Showing the principal pressure-points of the scalp. (*After Cunningham.*)

Stockman considered that rheumatic indurations were the commonest cause of headaches, and he considered that the exposed nerves of the head, supraorbital, temporal and great occipital and great auricular were specially liable to this peri-neuritis at the points where they emerge from deep cover. Head considered that the nucleus of the trigeminal nerve, together with the central connections of the first and second cervical nerves form the somatic portion of a great complex of segments of which the visceral part is represented by the vago-glosso-pharyngeal. Consequently in a case of headache of visceral origin the position of the tender areas of the scalp bears some relation to the segmental level of innervation of the painful focus in the cord. MacKenzie considered that headache was a clinical expression of many varied forms of disease, and that the trigeminal nerve nucleus in the medulla was the pre-potent sensory centre, whose irritation was a necessary link in the production of headache.

Headache may therefore be considered to be the product of two variable factors; firstly, an alteration in the resistance of the primary synapses concerned with the sensory nerves of the scalp; and secondly, the overflowing of an unusual impulse through these synapses into the pain tracts normally occupied with the transmission of afferent impulses.

The factors which influence the activity of the synapses are as follows: abnormal chemical products in the blood stream; electrical changes in the body, manifested during electrical conditions in the atmosphere; hereditary instability of the nervous system; not infrequently also a rise in body temperature, and an increase of blood in the cerebral vessels.

Headaches due to one particular cause, such as eye strain, may move from one part of the scalp to another. The site of a headache does not indicate the source of the abnormal impulse which causes it. The overwhelming predominance of the frontal, and to a lesser extent of the temporal regions of the scalp, as the site of headache is a matter of interest, and is a problem that may be approached on general lines from the standpoint of evolution. The chief characteristic of the human brain is the development of the neopallium, especially of the regions dealing with vision. Compared with the brains of lower animals, the development of the pre-frontal area is remarkable, and provides a great increase in the possible sources of an aberrant overflow from neighbouring neurones.

Headache is a symptom peculiar to man especially modern civilized man, and is a penalty of his great cerebral development. It is probably unknown among the lower animals, apart from the presence of gross anatomical lesions.

Headache is the commonest of human symptoms, as impulses from a variety of sources, cerebral as well as organic, can readily gain access to the pain tracts in connection with the scalp. The synapses guarding the pain tracts of the ophthalmic division of the trigeminal nerve appear to provide a pre-potent outlet for impulses liable to overflow, but the localization of any headache is no indication of the nature and source of the disturbing impulse.

In the treatment of headaches attention must be directed chiefly to the removal of the cause so far as may be practicable. Toxic conditions form an important group, and may in a large number of instances be treated more or less successfully. Reflex causes assume an undue prominence in the neurotic, anæmic, and the over-fatigued.

The severe crushing headache arising from new growths, chronic hydrocephalus and sometimes even apoplectic conditions may not infrequently be greatly relieved by ventricular cistern or lumbar puncture.

# Editorial

## THE MANAGEMENT OF HOSPITALS

WE are publishing in the present issue an article by Dr. James McKenty of Winnipeg on the Relations of the Medical Profession to Hospitals. The subject is one of interest to the medical profession, and to the public, and particularly to the sick and injured who apply to hospitals for relief. In it Dr. McKenty expresses the esteem felt by the profession for the efforts of the many able and busy men who freely give of their time and business training to serve upon the directorates of hospitals; also its respect for those members of religious orders, who for a bare sustenance devote their lives to the labour of caring for the sick and unfortunate. A discussion of the differences in fundamentals that in the past have arisen between Governing Boards of Hospitals and the Medical Staff, under present rulings of the Courts forms, however, the important part of the address.

The duties and responsibilities of hospital directors are, indeed, very considerable. The fabrication of new buildings, the alterations and additions to old ones, and the selection of the architect and builder demand thought and sound judgment in order that the funds committed to their charge by a generous public may bear full fruition.

In the selection of the medical staff and in the filling of vacancies as they occur, the profession naturally expects to have a voice. This is generally conceded. It is the medical staff that makes the reputation of a hospital. Every hospital is standardized in the judgment of the public by the quality of the work carried on in the wards by its physicians, surgeons and specialists. A hospital may be spoken of as beautiful as regards its buildings, its location and its attractive surroundings, but the family physician will send his patients to the hospital that has the most efficient attending medical staff.

Progressive physicians realize the importance of good nursing, of modern laboratories and of such other equipment as may be necessary if their patients are to receive the best that medical science has to offer. The cost of administering a hospital has increased tremendously during the past half century, and for that reason the Board of Governors often finds it difficult to meet all the requests as they arise.

Frequent conferences between the Superintendent representing the Governors, the Lady Superintendent representing the nursing staff, and the Medical Board, can overcome many difficulties and wipe out many misunderstandings, if conducted in a kindly way and in a sympathetic spirit.

A great deal of evolution has taken place in hospital management during the past two decades. There are often local conditions that have a considerable influence on methods of procedure, but after all the attainments, zeal and tact of the medical board must always exert a determining influence, and rightly so.

## THE MAZE OF MEDICINE

THE ancient practice of marking the opening of the session by an introductory lecture is retained at several of the medical schools, and some of the addresses delivered last autumn have found their way into print. Outstanding

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among these is the address of Dr. Andrew Balfour, Director of the London School of Hygiene and Tropical Medicine, in connection with the opening ceremonies of the new school of medicine and dentistry of the University of Rochester. This address is quite as engaging as its title: "Through the Maze of Medicine." Centering his thought upon Sir George Newman's plea for the permeation of the curriculum with the preventive idea, Dr. Balfour discusses this "new guide-rope which it is desired to introduce into the maze, this guiding principle which is intended to lead the student of to-day and to-morrow towards an objective, differing in some ways from that upon which the ambition of his predecessors has been set, an objective designed to make him not only a better doctor, but a more useful citizen, and to enlist his brains and knowledge in the service of the state, as a guardian of the public health."

The student's difficulty in realizing the application of his earlier studies to his future career is apt to create an unfavourable first impression. As in Dr. Balfour's day at Edinburgh, although the lecturer charitably thought it might now be otherwise, few students in biology, chemistry and physics can understand how fundamental these subjects are, and that they represent the platform on which must be built "that training in science, in scientific thought and method, which is essential if medicine is to be other than mere empiricism and quackery." By applying the preventive idea in the teaching of these subjects, Dr. Balfour contends that their bearing upon future activities would be illustrated, interest would be aroused, and study rendered much more attractive. His contention is supported by the citation of a number of opportunities for teachers of these subjects to "direct the student's mind along preventive grooves, or, to keep our original simile, see that he grasps the new guide-rope in the maze."

The lecturer expressed the opinion that it is easier to inculcate the preventive idea at the beginning of the medical course than during its later stages. But every subject in the curriculum may be utilized in the endeavour. Even anatomy, which the unthinking might regard as being barren in this particular, "can easily be turned into a quarry from which ideas on preventive medicine can be delved and shaped."

Dr. Balfour's address is admirably complementary to Sir George Newman's conclusions relative to the trend in medical education, and not only presents many suggestions for the betterment of teaching, but shows how easily such suggestions may be applied. It appears in the *Lancet* for November 20, 1926, and is to be commended to all teachers in our medical schools. Progress through the maze of medicine could be made perhaps less arduous and certainly more engrossing if each teacher contributed a strand to the guide rope, and thus aided in leading "to that conception of the prevention of disease which is becoming, if it has not already become, the lodestar of the physician, the hygienist and the research worker alike."

Dr. Frederick P. Gay, in addressing the entering class of the College of Physicians and Surgeons of Columbia University, followed a different line of thought. He spoke of the medical sciences, and pointed out their essentially biological nature. While they lack the definiteness and the finality of such sciences as mathematics, chemistry and physics, the complexity of the living cell and of those congeries of cells which we call an organism offers problems which may be baffling but are always fascinating. In the teaching of medicine, what is most desirable is to inculcate a point of view; "to teach the method of reasoning, first from cause to effect so that later, when you are called upon to deal with a sorry result, you can find the reverse process and find and remove the cause." The student is warned that in the early part of his course he will receive instruction the applicability of which is not immediately apparent, and that he must not be impatient at being held back from contact with patients. Seemingly, Dr. Gay is not impressed with arguments set forward in favour of the early admission of the student to the hos-

pital wards. The medical sciences should be presented completely and compellingly, so as to demonstrate their usefulness in the elucidation, prevention and cure of disease, and so that the student should leave college better able to measure the value of medical discoveries which will come within his life time, with an understanding of how to apply them, and best of all with an ambition to have in some way a part in them.

The entering class at Cornell was addressed by Dr. Edward L. Keyes, who spoke as a clinician. As a medical student he had had little of the type of work now required at medical schools, yet he does not fail to observe and admire wholeheartedly the rapid envelopment of medicine in the domain of science. Speaking on "The Virtue of Medicine as a Profession," he pointed out the variety of interests it presents, the variety of sciences founded and founding in the domain of medicine. Such constitutes the real attractiveness of the medical career. Dr. Keyes hints that scholarliness is desirable for any man—even for college presidents. There is something intriguing in this: "Our practical genius as a nation could have profited by the continuation of the old style president, who, like *Le President de la Republique*, must have been included in Clemenceau's French summary of the most ornamental but useless things in the world—along with Italy and the prostate gland."

The business of medicine receives some consideration from Dr. Keyes. Without getting into an "eerie swither" over a possible drift towards commercialism, he treats the matter idealistically. "Ours is a profession, never a business. We live not primarily for the purpose of making money. Those of us who are the greatest successes and the happiest men make no more than a bare living. Our profit and loss is not measured in dividends. Our duty is to discover the truth and present it to suffering humanity, from whom we seek only that *honorarium* which we honour the public by permitting them to pay us, according to their own honour (as Hamlet has it). We face life not as beggars, but proudly bearing gifts."

It is always interesting and often profitable to get the other man's point of view, and these three addresses, representing the attitude of the hygienist, the scientist, and the clinician to the problem of medical education, are timely and instructive. Quite naturally, each author emphasizes his particular interest, but none suggests any aggrandizement of his sphere at the expense of another's. All concede the necessity of the scientific foundation. On this point we may feel that there is now little difference of opinion. We shall probably never succeed in formulating a medical curriculum which is beyond criticism, but we may hope that, as teachers are brought together more and more in the investigation of disease from the viewpoint of each, a better understanding will be reached of the part which each should have in the curriculum. We have perhaps talked enough about a balanced curriculum, and might give heed to the rapid wane of our erstwhile faith in the balanced ration. But we must aim at a course of study which will adequately prepare the student for the maze which he must traverse throughout life, with some understanding of the complexities of the relationship of medical practice to social problems and to public welfare.

W. H. HATTIE

"Reasonable thought and observation are the chief roots of medicine; observation, however, is the thread by which the conclusions of the physician must be guided..... The simple polish of academics, the visiting of libraries, wealth in books which continue unread, and a name shining in all the journals; all these do not contribute the least to the comfort of the sick."—*Giorgio Baglivi* (*1668-1707*).

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# CONCERNING ANATOMY

"*The Salt*

He said the lad was handy with a knife,
The way he'd carve a rabbit up alive,
Or a young robin, maybe, just to see
What the innerds were like.

*The Scholar.* Anatomy!
A subject of minute research."
*From "Newfoundland Verse," by E. J. Pratt.*

THE titles of two recent publications by two of the most eminent living anatomists furnish no uncertain indication of problems which are agitating the minds of those interested in anatomy and the need for some approach to a solution of which is becoming more and more urgently felt. We refer to "The place of anatomy in medicine," by Sir Arthur Keith, (*Brit. M. J.*, September 4, 1926, p. 409), and "The significance of anatomy," by Professor G. Elliott Smith, (*ibid*, November 6, 1926, p. 815). Certain of the statements made by these authorities may be quoted. Sir Arthur Keith writes:

> "Why is it that in so many of us the zeal and enthusiasm with which we entered the dissecting room fade so soon and the anatomical 'Maconochie' of our dreams is dead before the morning dawns? The art of dissection is laborious; the accounts given in text-books are accurate, detailed, and prolix, but as dead as the parts described. Very soon. . . . the youthful student of anatomy becomes submerged in a chaos of fact. Some of the best minds which enter the profession of medicine turn from anatomy with contempt; for them it is but a catalogue of names. . . British teachers of human anatomy have realised. . . what is wrong with their subject. Their subject has been killed by tradition."

Again, referring to the separation of histology and physiology from gross anatomy which occurred about the middle of the last century, Sir Arthur Keith says:

> "No doubt the separation of anatomy into two branches had become inevitable, but the student of to-day may wonder why cleavage took the line it did. He may wonder still more how it was that the anatomists of that time were content to hold the husk of the human body when other anatomists ran away with the kernel and called it physiology. . . If he surveys the real additions which have been made to human anatomy in recent years he will see that they have been made, not by anatomists, but by physiologists. Gaskell, Langley, Ferrier, Sharpey, Schafer, Sherrington, and Head have been the best British anatomists of my time."

Professor Elliot Smith is no less frank:

> "The anatomist of the present day has retained in his teaching an undue amount of mediæval method and material that has no justification either on the ground of its practical or scientific value. In paying respect to these antiquated conventions . . . he has neglected the great opportunity of bringing the subject of anatomy into closer correlation with the needs of the times. The possibilities for great achievements in anatomy were never so great as they are to-day."

Who could refrain from coupling with his respect for their scientific eminence his admiration for the courage of the anatomists who would pen such words? Does such courage not inspire confidence?

The terminology of the anatomical sciences is somewhat unfortunate. To-day the term anatomy must be understood to connote the whole science of organic form or structure, without thought of the historical or philological ideas commonly associated with the word, *i.e.*, without respect to the methods by which the subject is studied. In other words, descriptive and topographical dissecting-room anatomy is but one aspect or branch of the great science, some of its other aspects being comparative anatomy, morphology, physical anthropology, embryology, histology and certain aspects of what is commonly thought of as physiology, not to mention such matters as œcology and heredity. The relations of this comprehensive science to medicine, and its importance thereto, are admirably expounded by Professor Elliot Smith. An attempt may be made, however, to state the matter a little differently.

We wish to keep our bodies healthy—to prevent and treat disease. We must, therefore, ascertain (*a*) the facts concerning disease and (*b*) the factors effective in the production thereof. The produc-

tion of the healthy body and the production of disease are alike phenomena of Nature. The factors effective in the production of disease are most intimately related to those responsible for the production of the healthy body. Hence, in like fashion as we look to certain of the facts of anatomy to explain certain of the facts of pathology, do we rely upon the factors to which the production and maintenance of the healthy body are due, as a basis for the elucidation of the factors responsible for disease. From this point of view, then, the objects of anatomy are, broadly speaking, twofold: (*i*) to ascertain the facts of the structure of the healthy body and (*ii*) to analyse the factors effective in the production thereof. In the latter task evidence must be adduced from every possible source, and here must the study of structure and that of function go hand in hand, whilst the necessity for co-operative study of structure, function and disease in the endeavour to elucidate the pathological in terms of the normal is no less obvious. For examples illustrating the importance of anatomy to the science of medicine, and in particular the significance of morphology in connection with experimental work, the reader may be referred to Professor Elliot Smith's lecture.

Touching the perennial problem of the teaching of anatomy, little can be added to Sir Arthur Keith's trenchant account of the devastating effect of much of the current teaching upon the minds of students. This does not mean, however, that the pendulum is to be allowed to swing too far in the other direction; Professor Elliot Smith allays our fears on that score. Both authors indicate certain lines along which the teaching of anatomy might be improved. To these it may be added that a considerable proportion of the descriptive and topographical facts, which are now taught in the first or second year of the medical course, might perhaps be postponed with advantage until the clinical years, and then, if studied at all, be studied as part and parcel of the clinical problems upon which they bear, and by the importance and interest of which they are enlivened; for example, the blood and nerve supply of joints might well be studied in connection with the arthritides. Close co-operation between clinician and anatomist would be called for here. Thus lightened, the pre-clinical study of anatomy might have a three-fold object: (1) To assist the cultivation of those attributes of mind without which no man or woman can be a good doctor, such as independent observation, accurate reasoning, sound judgment, and so forth; (2) to acquire such a knowledge of the facts concerning the body as will serve as an adequate foundation for the subsequent study of clinical anatomy; (3) to attain some measure of insight into the factors which go or have gone to make the healthy human body what it is.

Finally, it may be suggested that the main defects in our teaching of anatomy are to be found not so much in the attitude of the teachers as in the nature of the books which the students have to use; these are the greatest impediments to the scientific study of the subject. Yet, it is the teachers who write the books. Who will write us a book on anatomy every page of which will thrill us anew with the scientific inspiration—the "Divine afflatus"—so characteristic of Sir Arthur Keith's incomparable "Menders of the Maimed"? I. MACLAREN THOMPSON

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## THE HISTORY OF CANADIAN MEDICINE

MEDICAL History is always interesting and is beginning to attract general attention. A biologist in a recent address stated that in no department of science have greater advances been made than in medicine during the last few decades. The *British Medical Journal*, in a late issue, calls attention to the fact that arrangements are being made for the formation for the first time,

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of a section to be devoted to the History of Medicine at the forthcoming meeting of the British Medical Association in Edinburgh. Much interest has also recently been shown in medical history by many of the older universities in Europe, and almost all the larger medical schools in America are establishing historical libraries and lectures on important periods.

Edinburgh University was the first medical school in Great Britain to recognize the value to the practitioner of some knowledge of the history of his calling, and established in 1908 a lectureship on the History of Medicine. On this continent, McGill University established a Professorship of the History of Medicine in 1907, and the chair has been ably filled by Sir Andrew MacPhail since its foundation. The Johns Hopkins University Medical School has this year established a professorship in this subject, and has appointed as the first occupant of the chair Professor William H. Welsh who has done so much for literary culture in the United States.

With the development of Canadian medical institutions along national lines the desirability that all the important facts in our medical history should be brought out and published becomes a matter of some importance. In other national movements, a sense of duty and pride is invoked by appeals to the historical traditions of our country. Unfortunately, such an appeal, though desirable, would not be possible at present, as the story of Canadian medicine has, up to the present, been only very imperfectly told. In the various histories of medicine thus far published, the labours and achievements of the profession in Canada are not mentioned, in spite of the fact that Canada has played, and is playing, a prominent part in the development of medicine on this continent.

This situation seems to be the result of an unfortunate apathy of the profession to the history of the past. Very complete archives at Ottawa, Toronto, Montreal, Halifax and other centres contain a wealth of material which has never been touched, while many physicians who have studied the medical tradition of their localities are failing to publish the results of their researches and of their personal recollections.

The remedy lies in the hands of local medical societies in every province. Interest in subjects dealing with our medical history should be awakened, and research should be stimulated, and the facts thus obtained should be permanently recorded by publication in the *Journal*. Eventually, when our local societies become interested, and an Historical Section of the Canadian Medical Association is formed, our medical history will assume the important place it merits in the development and progress of medicine in America.

C. J. TIDMARSH

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## ON THE CONSERVATION OF HEARING IN SCHOOL CHILDREN

DEAFNESS as well as blindness is a most serious handicap to any child, interfering with education, and in not a few instances with the proper development of the brain. We are glad to note therefore that the profession, and of late years the general public, are awakening to the seriousness of the handicap placed on the child who has even a moderate degree of deafness, and valuable work is being done at the present in an endeavour to cope with the situation. The examination of a large number of school children has revealed an alarming amount of impaired hearing even in the very young. A great step forward was taken a few years ago by the formation of the American Federation of Organizations for the Relief of Deafness, and as its name signifies an attempt was made by it to correlate the efforts of the public and of the profession all over the United States and Canada. One of the first steps undertaken by the league was the appointment of a committee to investigate the best methods of dealing with

large numbers of children. The difficulty of carrying out individual tests greatly interfered with the obtaining of results in the large numbers of children gathered in many schools. We are glad therefore to call attention to the perfecting of an instrument termed the phonograph audiometer by Dr. Harvey Fletcher, working in the laboratories of the Bell Telephone Company. With this instrument it is said to be possible to test children over eight years of age in groups of forty, and to test each ear separately. The instrument consists of a phonograph and recorders from which speech vibrations are electrically conducted to a telephone receiver attached to each child's ear. An attenuator has been introduced into the electrical circuit in such a way that the intensity of the waves or vibrations produced by each spoken number may be regularly reduced by three exact sensation units as numbers are spoken in succession. This reduction is secured by placing an attenuator, which is a system of resistors in the circuit from an electric sound generator, and the attenuator is so arranged that by turning a dial it is possible to change the intensity of sound from the threshold of hearing to magnitudes as loud as the ear can stand. The dial is divided into units which have been called sensation units[2]. The children are supplied with prepared charts and they are instructed to write the numbers they hear in the proper columns. The sound easily heard at first by all becomes gradually weaker till each child fails to get the numbers correctly. These charts are corrected from standards; and all the children who have difficulty in writing the numbers on the charts as supplied through the phonators, (thus indicating an impairment in one or both ears,) are singled out for more detailed examination with a view to accurate diagnosis and treatment. For children under eight years of age the 3-A Western Electric audiometer is used. It consists simply of an electric buzzer, an attenuator, and an ear-phone. These children must be tested individually. There is still some uncertainty as to the amount of impairment which shall be considered to indicate definite trouble. Fowler and Fletcher[1] consider any child with a loss of nine sensation units or over, as hard of hearing. Taking this as the standard they find that in New York schools which they examined, fourteen per cent of the children are hard of hearing, and if this percentage is a correct average three million children in the United States have some impairment of hearing. Horace Newhart[3] finds that, of the children examined in Minneapolis thirty to fifty per cent show some impairment of hearing. Harold Hays[4] says that three per cent of all the children of the United States are suffering from ear conditions that interfere with their work in school. He further points out that many children have never received any nose and throat treatment, and that eighty per cent of the children suffering from catarrhal or non-supperative otitis can be cured by simple politzerization; the majority of the suppurative conditions can also be cured by prompt and proper treatment without any radical mastoid operation. This is further supported by Douglas Guthrie[5] who has reviewed a series of five hundred ear cases. Guthrie found that seventy-five per cent of the acute suppurative ear conditions were cured by conservative treatment, and that fifty-seven per cent of the chronic suppurative conditions may be cured by conservative measures. Of the cases of acute mastoiditis seventy-five per cent were cured by the simple mastoid operation. Of the cases of chronic suppuration requiring operation seventy-five per cent of those treated by the simple mastoid operation were cured, whereas only twenty-five per cent of the cases were cured by the radical mastoid operation. Fowler and Fletcher[1] suggest that the schools should establish a diagnostic clinic for those children found defective by the group test, so that more accurate diagnoses could be made, and the children referred to the clinics of the general hospitals for appropriate treatment. They believe yearly tests should be made of the whole school. Cases of impaired hearing when once detected should be carefully watched over a period of years.

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For those actually hard of hearing special classes in lip-reading should be established. To help those children to appreciate rhythm, accent, and emphasis, which make speech so interesting for the person of normal hearing, Robert H. Gault[6] has developed an electro-magnetic transmitter and receiver, which enables the deaf child to feel with the finger tip the peculiar vibration of the word that has been spoken. After studying for some time the characteristic vibrations of the vowel sounds and words these children learn to recognize the words, and make out sentences. It has been found that children pick up lip-reading much more quickly and efficiently when it is associated with this touch factor. They are able to remember speech in terms of tactile images. The fact that rhythmic sentences give them more pleasure than ordinary sentences, it is thought possible by similar means to have the vibrations of music transmitted to these pupils. For classes with slight hearing defects, O. C. Smith[7] has perfected an amplifier to which individual ear-phones are attached. Each ear-phone is so constructed that the volume of sound can be regulated to suit each child. By using this instrument the general progress of the class is very much improved.

Among the many activities of the League for the Hard of Hearing, mentioned by Hays,[4] is the attempt to protect the deaf child and those who would befriend it from the charlatan. For the benefit of the otologist the league is trying to determine the value of the different aids to hearing, and it is now compiling a list, with the addresses of all the lip-reading teachers throughout the country. It is also attempting to standardize tests for hearing in order to make possible a comparison of results. At present there are branches of the league in the majority of the cities of the United States and Canada.

W. J. McNALLY

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## RACIAL CHARACTERS OF THE SKIN IN RELATION TO HEALTH

UNDER this title the first Malcolm Morris Memorial Lecture was delivered on November 15, 1926, by Professor H. J. Fleure of the University College of Wales. In his presidential address before the Section of Anthropology at the meeting of the British Association for the Advancement of Science at Oxford last summer Professor Fleure called attention to the same subject, urging the characters of the integumentary system as a profitable point of attack upon the problem of the evolution of human racial types.

He expresses the view that during the terminal phases of the great Ice Age (Pleistocene) the modern type of mankind, which at that time had not acquired the degree of racial differentiation exhibited by it to-day, inhabited a region extending from the Atlantic edge of the Sahara to Persia—the Sahara, Arabia and Mesopotamia being then cool grasslands. He considers the modern man of that period to have been more or less brown-skinned, with blackish hair and brown eyes. His jaws and eyebrow ridges were much reduced when compared with the condition of these structures exhibited by many of the early forms of mankind, and his head was almost balanced on his vertebral column. The complete attainment of the erect posture, however, had not yet become universal.

In the course of his Oxford address, Professor Fleure attributes the evolution

of man in great measure to the influence of his environment. As climatic conditions improved, groups of men migrated northward from their original habitat into Europe and others eastward into Asia, while some drifted southward into the heart of Africa. The latter were probably physically inferior in some respects, and in response to the torrid climate their bodies developed certain cooling devices, such as large superficially placed cutaneous vessels, everted lips, and poorly developed noses which reduce the extent to which the air is warmed before entering the pharynx.

Both Professor Leonard Hill and Professor Ellsworth Huntington have concluded that physiological efficiency is best maintained in cool, temperate climates presenting variations in temperature and a certain modicum of storms. The groups of early modern men which migrated in a northerly direction developed physical responses to such a stimulating environment. Prenatal life and infancy were lengthened, necessitating protraction of the period of maternal care; this in turn doubtless contributed to the differentiation between the activities of the male and those of the female, the former following such pursuits as hunting, whilst the latter cultivated the soil and garnered its fruits. Thus, man obtained command of two mutually supplementary types of foodstuffs. Skin characters in different parts of Europe appear to constitute, to some extent at any rate, a response to climatic conditions, and in this connection Professor Fleure discusses the risks to which Europeans subject themselves when they reside in the tropics.

He insists on the importance of variation in climatic conditions in developing bodily efficiency and increasing mental powers, and considers the characters of the skin and hair of Europeans, and of the races of the world generally to constitute to some degree an indication of general constitutional differences, which seem to be connected not only with adaptation to certain climates, but with resistance to various diseases.

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## THE DEVELOPMENT OF OBSTETRICS*

IN his inaugural address to the students of Edinburgh University, Dr. Johnson sketched the history of obstetrics from early times to the present day. While midwifery must have been the earliest of all medical arts, little progress was made until the last two hundred years.

In the early days, midwifery was practised entirely by untrained midwives and the doctor was only called when the patient was moribund. William Clowes, the most renowned English surgeon of mediaeval days tells us that obstetrics and surgery were practised by tinkers, horse gelders, carters, sooth-sayers, and the like, with the result that a woman in normal labour had an even chance of recovery, while if in difficult labour, she was usually butchered to death. Teaching of midwives was considered unnecessary, since it was their belief that, "Dame Nature is the proper midwife, and nobody can be better qualified to attend her dictates, than Dame Ignorance."

During the seventeenth and eighteenth centuries, knowledge of obstetrics increased greatly in England. To William Smellie and Chamberlen, two of the most renowned of obstetricians, we are largely indebted for this progress. The delivery of the child's head in difficult and obstructed cases, had always been the worry of obstetricians until Chamberlen devised the obstetrical forceps. This instrument, it was realized could not be used by the untrained midwife, hence patients, more and more, sought the aid of the trained accoucheur.

In Scotland, however, obstetrics had not made such rapid strides. Midwives,

* Inaugural address at the University of Edinburgh, by Professor R. W. Johnstone, *Brit. M. J.*, Oct. 16, 1926.

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nicknamed 'howdies' devoid of any training, still attended all confinements. In 1726, however, the City Council of Edinburgh, urged on by the incorporation of surgeons, effected the foundation of the first chair of midwifery in the world. Joseph Gibson was the first to fill the office, and his duties were the training of midwives. Some thirty years later, Sir Thomas Young instituted the clinical teaching of obstetrics for medical students. He fitted up, at his own expense, four beds for lying-in women, in an attic. This was the origin of the Royal Maternity Hospital. It was not until 1866, that it was necessary for medical students to be qualified in midwifery in order to qualify as practitioners.

Until the time of Sir James Simpson, gynæcology as a separate branch of surgery had not existed. Thirty years before this however, McDowell had performed the first ovariotomy in the backwoods of Kentucky. Simpson did much to promote the further growth of gynæcological surgery by discovering the anæsthetic power of chloroform. The work of Pasteur and Lister, on sepsis and asepsis, and of Oliver Wendell Holmes, White and Semmelweiss on puerperal infection, also contributed largely to the progress of both obstetrical and gynæcological science. To William Ballantyne, however, must be given the honour of developing the very important new branch of obstetrics, antenatal care and pathology. It was he who first pointed out that many of the accidents of labour and of the diseases of pregnancy could be avoided by systematic antenatal examinations and treatment. ELEANOR PERCIVAL

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## THE EARLY RECOGNITION OF COMMENCING MYOCARDIAL WEAKNESS

IN an interesting article the *Lancet*[1] calls attention to an address delivered before the Royal College of Physicians of Edinburgh, by Dr. John Cowan, on the early diagnosis of impending heart failure. No condition in medicine is of greater importance, and none demands more alert attention at its early stage, when in many cases precautionary measures may effect so much. In the speaker's opinion the word "cure" is hardly ever applicable to organic heart disease, when it is definitely present. It may be possible to relieve symptoms and perhaps improve the functional efficiency of a diseased heart. Physicians may, perhaps, look forward to the day when they will be able even to prevent heart disease, but at the present they have to recognize that a heart once damaged is permanently damaged, and can never be restored to its normal condition. Dr. Cowan, therefore, rightly emphasized the importance of recognizing early any impairment of the heart's capacity for work. The study of its functional ability must be regarded as of more importance than any study of the heart sounds. Despite the teaching of the past quarter of a century, and despite the overwhelming evidence to the contrary afforded by the examination of hundreds of healthy young men during the war, it still happens that people with functionally normal hearts are told they are suffering from heart disease, because of the discovery of a systolic murmur or of an occasional intermission in the radial pulse.

A progressive diminution in cardiac response, no matter how trivial it may appear to the patient, provided it cannot be accounted for by other causes, is always suggestive of the beginning of myocardial insufficiency. Although in many cases the history alone suffices to clinch the diagnosis, it is as a rule desirable to supplement it by physical tests appropriate to the physique and age of the patient, and no test is more universally applicable than the ascent of a flight of stairs. The simple movement

of raising the body with one foot on a chair is less trustworthy, for it introduces the factor of balance and the use of less trained muscles.

Attempts have been made to obtain a numerical expression of the heart's efficiency, and the one which has gained most general acceptance is the amount of increase in the heart rate following a standard exercise, compared with the resting rate taken two minutes after the cessation of the exercise. This is a rough guide but it in no way fulfils the requirements of a truly quantitative test. More reliance, perhaps, should be placed upon the severity of the symptoms produced; the character of the breathlessness, the præcordial discomfort, or the dizziness induced by the exercise.

While emphasizing the importance of an estimation of the functional efficiency of the heart, the significance of progressive changes in the physical signs should never lack recognition. A gradually increasing cardiac enlargement with impure heart sounds which subsequently give place to definite murmurs, and the gradual development of œdema in the dependent portions of the body more or less associated with indications of congestion in the internal organs, must always be regarded as demanding the physician's care and treatment. Of much importance also is a progressive fall in the systolic blood pressure, a sure sign of myocardial failure. The systolic arterial pressure is a measure of the heart's power to meet its liabilities, and should bear a quantitative relation to the diastolic pressure, but as the heart finds it more and more difficult to carry on, the systolic and diastolic values tend to approach one another. Additional evidence of myocardial trouble is afforded by the electrocardiagram. The bundle branch block has an established place in prognosis. There are, however, other changes of a similar nature associated with the onset of failure, of which the significance is not yet fully understood.

Examiners for life insurance companies are not infrequently called upon to decide, not only on the possible presence of myocardial impairment in the later decades of life, but also on its amount and on the probability of its seriously interfering with the span of life. In a recently published volume Dr. Harold M. Frost,[2] assistant medical director of the New England Mutual Life Insurance Company, describes an instrument recently devised by him for the determination of the functional capacity of the cardiovascular system, and its ability to withstand strain. The apparatus consists of two parts, a vacuum pressure Tycos gauge registering positive and negative pressures in centimetres of mercury, and a Simplex spirometer of the wind-wheel type, in which the revolutions of the wheel register upon the dial in cubic inches the amount of air expired. These two are joined by means of a Y tube to a suitable length of strong rubber tubing, one end of which is connected with a mouthpiece, removable for sterilization. The technique as described by Dr. Frost for the use of this instrument is complicated and the article itself should be consulted. Determinations of blood pressure are made under full inspiration and full expiration, both under normal conditions and under conditions of varying pressure. The writer states that after using it as a test in 1,500 consecutive cases, he has formulated a scheme of interpretation of the results obtainable by this instrument, which will afford information, hitherto unobtainable, as to the functional capacity of the cardiovascular system.

Furthermore, we may here call attention to a recent contribution to this *Journal*[3] in which Dr. F. H. McMechan discusses methods for the evaluation of the surgical operative risks undergone by patients with impaired vital capacity, and the measures by which the amount of risk may to some extent be estimated. He quotes Moots' index of operability, which is as follows: The pulse pressure of a patient divided by the diastolic pressure gives a pressure ratio percentage. Fifty per cent is the normal pressure ratio; if the percentage is high, above 75, or if low, below 25, the operative risk is bad, and there is reason to apprehend danger

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in any operative measure necessitating anæsthesia.

The reactions of the respiratory function gauging as they do the acid-base balance of blood and tissues, also afford a reliable method of evaluating reserve vitality. According to Yandell Henderson, quoted by McMechan, *the breath-holding test* is a reliable index of the respiratory function which may be made on any patient by the physician. He gives the following directions for making the test. The patient should sit quiet for five minutes and then take a full but not too deep breath. This he must hold with the mouth and nostrils completely closed, noting the length of time for which it can be done. Roughly speaking, in health and with a good heart, the breath can be held for 45 seconds or more. Candidates who could not hold it for this length of time were rejected as unfit for the French aviation service. While this test is a delicate and accurate gauge of blood and tissue chemistry, it must also be regarded as a gauge of the vital capacity. For clinical purposes the vital capacity in cubic centimetres may be regarded as one hundred times the breath-holding test in seconds.

Thus, a breath-holding test of the normal length (45 seconds) would predicate an average vital capacity of 4,500 c.c.; whereas, a test lasting only 15 seconds would indicate a vital capacity of only 1,500 c.c. Patients with cardiac disease can lead a normal life, if their vital capacity is above 90 per cent of these average figures. A vital capacity of only 70 per cent demands restricted activities. When the percentage falls below 70, dyspnœa begins to show itself on moderate exertion; when as low as 40 per cent is reached dyspnœa becomes pronounced, and decompensation is either present or is readily brought about. It is to be remembered, however, that all breathlessness is not due to cardiac weakness, and the amount of dyspnœa may, in some cases, be greatly influenced by the acidæmia of a nephritis.

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## VALUE OF IRON AS A THERAPEUTIC AGENT

THE value of compounds of iron from both organic and inorganic sources for the relief of the various types of anæmia has recently been the subject of much discussion and considerable experimentation. The hæmoglobin formation, it is now thought, does not represent the full action of iron in the economy. Sherman,[1] in a recent brochure, expresses the situation broadly in the statement that iron stands in the closest possible relation to the fundamental processes of nutrition as an essential element, both of the oxygen-carrying hæmoglobin in the blood, and of the chromatin substances that appear to control vital activities within the cells. Recent research would indicate that small amounts of organic iron may play an important part in catalysing the oxidation-reduction reaction through which the potential energy of oxydizable food stuffs is made kinetic for the support of the work of the active tissues of the body. The small amount of iron in the body would indicate, also, that there cannot be any great demand for this element from a quantitative standpoint. The widespread distribution of iron in natural foods in connection with the small amount actually present in the blood has given emphasis to the belief that it is the type of the iron compounds available in food rather than the actual quantity of iron that determines physiological usefulness.

Recent clinical observation and animal experimentation would also indicate that the secondary anæmia following depletion of the hæmoglobin through hæmorrhage is not identical with some of the more common conditions of iron shortage. Experiments by Mitchell and

Schmidt[2] would indicate the value of iron from both organic and inorganic sources for the relief of a true nutritional anæmia, while the belief that the green chlorophyl in plants has a particular significance in influencing the availability of iron is borne out by these later experiments. Contrariwise, the experiments of Williamson and Etts[3] would indicate that iron, in all its forms and combinations is of little value in severe anæmia due directly to the loss of blood by bleeding, and in such cases transfusion is demanded as the only rapid and effective measure. The difference in the therapeutic value of iron in these two forms of anæmia is clearly shown in the case reported by Goldbloom in our January issue.

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# Editorial Comments

## ON THE AFTER EFFECTS OF POISON GAS

An interesting case illustrating the after effects of poison gas appears among the clinical notes in a recent number of the *Lancet*.* The history is given by Dr. Nelson, assistant physician to St. George's Hospital and to the Brompton Hospital, and as the patient was a Canadian it will be read with interest by the profession in Canada.

The patient, a Canadian, was gassed at St. Julien about April 23, 1915, during one of the first gas attacks in the second battle of Ypres, so that his condition was probably due to pure chlorine. He developed a bad cough and frothy sputum, but did not give up till May 24th, after a second gassing at Festubert. He was rapidly transferred to Le Havre and thence to England. At this time he had a great feeling of distress about the throat and left chest, with dyspnœa, severe cough, and copious sputum. A month later the eyes were still very engorged, the cough had nearly ceased, the area of cardiac dullness was decreased, but there was poor chest expansion and air entry, especially on the left side, with a few rhonchi. The note was made: "Probably some old broncho-pneumonic condition on left side," and he was described as looking thirty, although forty-one years of age. By September 16th his condition and personal comfort had very much improved, though rhonchi were noted with some shortness of breath. A medical board, in October, 1915, found: "Small expansion of lungs, breathlessness on exertion with pains over chest; some parts show large dry râles and other parts intensified breath sounds. Has been steadily losing flesh." Otherwise, the examinations of urine, blood, etc., were negative. The board recommended his discharge as one permanently unfit, and on his return to Canada another board discovered "suspicions signs of softening at right apex," gave him a 50 per cent disability pension, and ordered him for observation. No evidence of tuberculosis was found.

There is no further record until 1917, when he had apparently returned to England. He was then described as very short of breath, and the word asthma was used. He was thereafter examined every year in London, and noted as having chronic bronchitis and emphysema with steadily increasing shortness of breath. About 1921 he appears to have first mentioned general nervousness, and a neurological board found a mild degree of anxiety neurosis. In 1924 he was sent to the tuberculosis officer of a reputable London chest hospital, who found bronchitis, and inin 1925, at the same hospital, an acting tuberculosis officer found "pulmonary tuberculosis, slowly active," and this put his assessment up to a much higher level—not, I should think, unjustly.

In February, 1926, a board made a statement to this effect: "Weight 109 pounds (120 pounds on enlistment). A barrel-shaped chest, marked bronchitis all over. Pensioner states œdema at times, none now. Pulse 90, with poor exercise tolerance." He was given 80 per cent of disability but no sign of tuberculosis was found.

He was admitted to St. George's Hospital in April, 1926, and was then a cyanosed man, looking several years more than his age, with marked œdema of both legs and the left arm, and slight clubbing of the fingers. The apex of the heart was one inch outside the nipple line and the beat was very irregular with numerous extrasystoles. His blood pressure was 140-90, and his vital capacity 63 per cent below normal. He had a round emphysematous chest with poor but equal expansion. There was dullness over the lower half of the right lung behind, with rhonchi and

* The *Lancet*, Dec. 11, 1927.

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sibili all over both lungs—so loud and persistent that it was impossible to describe his breath sounds. Urine was very scanty with a fair amount of protein. The deposit contained red cells, pus, and granular casts. No organism was found in the urine, nor any tubercle bacilli in the sputum. The Wassermann reaction was negative.

After a week in hospital the urine had increased to about 40 oz. per day, and contained nothing abnormal; after a month he was greatly improved in every way, and was getting up and about.

On June 3rd, however, he complained of pain in the left side and his temperature rose to 102° F. The next day the classical signs of broncho-pneumonia were present in the left lower lobe. He became very feeble, blue, and dyspnœic, and on June 8th complained of pain in the right side, though no certain signs beyond numerous moist râles mixed with the rhonchi were discernible. The next day he died rather suddenly in a fit of dyspnœa.

*Post mortem examination.*—All the organs appeared normal except the heart, which was flabby and friable, but without gross organic lesion; the kidneys were unusually flabby, but otherwise normal; the liver was congested; and the lungs. The left lung showed confluent broncho-pneumonia, mostly in the lower lobe. The whole lung and especially the lower half was more water-logged than usual. The pleura over the right lower lobe was much thickened, and within the lobe were many small bronchiectatic cavities. The lobe was water-logged. The upper lobes were congested. There was no sign of tuberculosis.

This man had no history of any previous disease. This fact taken in connection with the note by one of his early boards that he looked younger than his age, would make it appear probable that the patchy bronchiectasis of one lobe must be attributed to lesions in the bronchi caused by the direct action of chlorine on them. The conclusion cannot be avoided that the tense inflammation of the whole respiratory tract following gassing, if it does not clear up quickly enough to prevent the death of the patient, may leave behind it a partial necrosis of the bronchial walls. The original lesion as noted a few weeks after his gassing pointed to the left side being chiefly affected. It was regarded as possibly some old broncho-pneumonic condition. The patient's fatal broncho-pneumonia started on this side. The thickened pleura over the cavity area is rather curious, and it is still more curious that the dullness to percussion which it produced, was not noted until I saw him. It certainly had been there a long time. Some thickening of the pleura is not uncommon near such cavities, and many of these were near the surface of the lung. Whatever its cause, it effectively blanketed any direct stethoscopic evidence of cavitation, even if the cavities were large enough to give physical signs. The cardiac dilatation and albuminuria appear to have been secondary to the pulmonary condition. They came on suddenly and disappeared rapidly.

That bronchiectasis does follow gassing has been realized for some years. It is not yet obviously common, though it probably will be more frequently met with every year for some years. I have seen recently another man with early generalized bronchiectasis who is, and has been at work since demobilization in 1919. He was gassed and has had a cough gradually increasing in severity all the time. He is legally debarred from applying for a pension because it is more than seven years since he left the army. The seven year rule of the Royal Warrant will go very hardly with these cases, and this is a point to which wise and benevolent Ministers of Pensions might well direct their personal attention.

## A VACCINATION ENQUIRY

In these days when smallpox appears to be definitely on the increase and anti-vaccinationists are so aggresively assertive, a recent edition of the *Lancet** calls attention to an address delivered before the Berne Medical Club by the medical officer of health for that city, in which the results obtained by a committee consisting of two medical men, three laymen one of whom was an anti-vaccinationist and the other two opponents of compulsory measures, is reported. The committee was appointed by the Berne city council to enquire into a few supposed evil effects of vaccination among approximately 40,000 persons who had been compulsorily vaccinated between the spring of 1922 and the autumn of 1924, on the occasion of an outbreak of smallpox in the city and its vicinity. Only fourteen cases in all were reported to the committee, which after a careful investigation found that in only four of these was there any possibility of connection between the disease reported, and the previous vaccination. The first case was one of encephalitis lethargica in a youth aged seventeen, who developed the symptoms shortly after vaccination, but made an almost complete recovery. The second case was one of fatal septicæmia following measles which occurred in a girl of nine years, who unfortunately was vaccinated on the third or fourth day of the incubation period. In the third case, a child aged fourteen, six days after vaccination developed tonsillitis, which was followed by a fatal septicæmia. The fourth case was that of a boy aged thirteen vaccinated six days

* *Lancet*, December 11, 1926.

after recovery from a gastro-intestinal attack, a week later symptoms of acute septicæmia developed, and death took place. The lesson to be learned from these cases every one of which might have been prevented, is that on the slightest suspicion of an acute infection vaccination should not be performed. The medical officer remarks that in only one out of 10,000 vaccinations was any evil effect attributed to the process, and the occurrence of such cases, which with care could have been prevented, should not be allowed to outweigh the enormous benefit conferred by the absolute protection against smallpox afforded by vaccination.

## PELLAGRA

An interesting paper on the *Symptoms and Findings in fifty-six Cases of Pellagra* was read by Dr. Sutton before the Southern California Medical Association.* Of these fifty-six patients, thirty were females and twenty-six males. The age varied from six and one-half years to sixty-seven years. In spite of the fact that the patients placed in hospitals were severely ill, and those who were ambulatory were of a less severe class, the opinion was formed that pellagrins do better when not hospitalized. Fifteen of the fifty-six cases definitely improved and eleven died. The tendency of the unknown toxin of pellagra to express itself in the three great systems of ectodermal origin, the skin, the alimentary tract and the central nervous system is obvious, and is manifested by the familiar diagnostic tripod of dermatitis, diarrhœa and dementia.

At present there are two distinct theories regarding the etiology of pellagra; the first of which Goldberger is an able exponent, is that pellagra is a deficiency disease due to a low protein diet, the second is that pellagra is due to pathogenic intestinal flora. That pellagra is a deficiency disease comparable to beri-beri or scurvy was not demonstrated in any of the cases in this series, since in many instances the patients had been living on a high protein diet. Viswalingam has called attention also to the fact that patients with pellagra do not automatically improve on diets containing more protein. Jobling and Peterson found that a number of cases had occurred in individuals partaking of a wholesome varied diet. Excluding patients in whom severe complications were present, those who were hospitalized and received intensive protein dietary showed the highest mortality. On the other hand, patients who were kept ambulatory, for whom gradual, but frequent slight changes were made in the diet, and who consistently carried out the instructions given to them, did on the whole remarkably well. The following conclusions were arrived at. Pellagra is probably not a simple deficiency disease like beri-beri or scurvy. The causative agent is probably of an infectious nature, and gives rise to a substance which sensitizes the patient to sunlight. Ambulatory patients do better outside the hospital on a gradual readjustment of diet, than in a hospital on a suddenly changed or forced dietary. The necropsy findings are trivial for such a severe disease. A diagnosis of the lesions of the skin is essential for a correct diagnosis of the disease.

* Pellagra, *Am. J. M. Sc.*, Phila., Sept., 1926, clxxii, 374.

## THE SECOND IMPRESSION OF THE SIR WILLIAM OSLER MEMORIAL VOLUME*

Within six months of its publication the first edition of this Memorial Volume has been distributed to the subscribers, and a second impression has become necessary to meet the continued demand. The warm and generous reception thus accorded is but another evidence of the universal affection in which the memory of the late Sir William Osler is held by his own, and by succeeding generations at the present time. The many tributes here assembled, simple and unassuming as they are, have sprung direct from the experience of those who knew and venerated him, and the note of restrained hero-worship revealed will strike an answering chord in all readers. As Dr. Camac has said under the title *The Duty of the Disciple*, "An example such as Osler gave can only be transmitted effectively by the personal word of those who themselves, saw, heard, and knew him, and felt his influence." This array of writers in their contributions convey in terms of sincere homage and affection their appreciation of this wonderful and inspiring influence.

* The Sir William Osler Memorial Volume of the International Association of Medical Museums, with Classified and Annotated Bibliographies (representing its Bulletin No. IX). *Second Impression.* Privately issued at 836 University Street, Montreal, Managing Editor, Maude E. Abbot, M.D. Subscription price $10.00.

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The classified annotated bibliography of his publications, is, in itself a revelation, not only of his extraordinary productivity, but also of his great powers of observation and the extent of personal research which underlies the immense contribution which he made to medical science and to the progress of his time.

This second impression contains several new features, which further enhance its interest. Sargent's great picture "The Four Doctors" is reproduced in colour with fine effect and three new group pictures, contributed by Dr. C. K. Winne, have been introduced in the Baltimore period. Ten additional appreciations and reminiscences received too late for the first issue, have also been added. There are articles by Sir Sharpey-Schafer, Drs. J. B. McConnell, F. G. Finley, Harry Marshall, L. G. Rowntree, P. M. Foshay, Kate Campbell Mead, W. Grant Stewart and Lawrason Brown, and a new sonnet "The Healer" by Marian Osborne.

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As he himself had recently passed the three-quarters-of-a-century mark, Dr. William H. Welch, chairman of the Milbank Memorial Fund's Advisory Council, at the annual dinner at the close of the tuberculosis and health conference assured his hearers that the span of life is increasing. "Few of the great discoveries of preventive medicine, except for the prevention of yellow fever, are anywhere nearly fully applied. There is a popular notion at large that the average span of life is decreasing. Upon advice of distinguished statistical counsel, Dr. Welch stated he could assure his audience that such is not the case. Life has been lengthened materially, even in the last twenty years. Between 1911 and 1922 the mortality rate from all causes in the registration area of the United States decreased from 14.2 to 11.8. In New York State during the same period it decreased from 15.7 to 13. In New York City from 1910 to 1922, it declined from 16 to 11.9. in the last sixty-five years, the average length of life has been extended fifteen years. New discoveries, utilization of recently acquired knowledge, closer application of accepted principles of hygiene, improved working and home conditions—these are the things counted on to bring about further decreases in the death rate. Public care of health and the spreading of medical knowledge among the people already have helped. But much, he added, still remained to be done in educating the general public in the ways of conserving health."

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## Men and Books

### A SHORT HISTORY OF THE MEDICAL FACULTY OF THE UNIVERSITY OF MONTREAL

By L. D. Mignault, M.D.

*Professor of Descriptive Anatomy, Université de Montreal*

The present Medical Faculty of the University of Montreal is the lineal descendant of a school founded in 1843 by Drs. Thomas Arnoldi, Francis Badgeley, Pierre Munro, William Sutherland, and J. McNider. They were few in number, but so were, in those days, the branches of medical science. Thus Dr. McNider taught midwifery; Dr. Arnoldi, anatomy and physiology; Dr. Munro, surgery; Dr. Badgeley, practice of medicine, and Dr. Sutherland, chemistry and materia medica. The fee for an annus medicus, was to say the least, moderate, amounting to six pounds and five shillings, or about twenty-five dollars, though later, if a student desired to follow lectures in both languages, he was charged two pounds more.

There was also a dispensary for clinical work, and the general public of those times probably abused medical charity, even as it does to-day.

Dr. McNider soon disappeared, as he died in 1846 of tuberculosis, after a long illness. He seems to have been a very able man, for despite his youth he was a member of the staff of the Montreal General Hospital, and one of the founders of the old Maternity on St. Urbain St. My fellow graduates will doubtless remember this institution, and its matron, Mrs. Hanna.

The school itself occupied a building on the same street, not far from Craig, which has only recently been demolished.

In 1845 a bill was passed at Quebec, incorporating the faculty under the name of the Montreal School of Medicine and Surgery, and the charter members were those named above, with Dr. Horace Nelson, who replaced Dr. McNider.

It might be well to say a few words about the founders of the school, as they have long since passed away.

The president, *Dr. Francis S. Arnoldi,* commonly called "Tom" by his friends, was the son of Dr. Daniel Arnoldi who was for many years physician to the Montreal jail. Both

father and son were present as surgeons at the battle of St. Eustache in December, 1837, and were called upon to make an autopsy on the remains of the unfortunate Dr. Chenier, the leader of the patriots. Dr. Arnoldi remained president of the faculty till 1849 when he retired. He was appointed professor of forensic medicine in McGill for a year, and then he moved to Toronto, where he died in the early sixties.

*Dr. Badgeley,* the first secretary, resigned shortly after the foundation of the school and re-entered it a few months later and resumed his teaching of the practice of medicine.

*Dr. William Sutherland* became secretary of the faculty on the retirement of Dr. Badgeley, and held that position till he resigned in 1849, and entered McGill as professor of chemistry. Ill health which seemed to dog the footsteps of several of the founders, forced him also to retire and he died of tuberculosis in 1872. Sutherland was an able lecturer, and gifted to a remarkable degree with eloquence, and his speeches on all occasions were looked upon as models by those who had the good fortune to hear him. His home was at the corner of Dorchester Street and Union Avenue.

*Dr. Pierre Munro* was descended from a Scotch family, the Munros of Foulis. One of his aunts married the last Marquis of Lotbiniere, and was the great-grandmother of Dr. L. DeL. Harwood the present dean of our faculty. Dr. Munro was an able surgeon, as surgery went at the time, and his first operations were performed without anæsthetics, for Sir James Simpson had not yet discovered chloroform. Dr.—afterwards Sir William Hingston was for many years an assistant to Dr. Munro and always spoke with admiration of his skill and resourcefulness in unexpected difficulties.

*Dr. Horace Nelson* who replaced Dr. McNider when the school was incorporated, was the son of Dr. Wolfred Nelson, the leader of the patriot party at St. Denis. A sister of his who lived for many years in Montreal used often to speak of the battle when Colonel Gore who had come up from Sorel to arrest Papineau was defeated. Young Horace was sixteen at the time, and was arrested on three occasions by constables who were anxious to show their zeal, after Colonel Wetheral had been victorious at St. Charles, but Madame Nelson who knew Wetheral well, obtained her son's release, and the family took refuge in Montreal, as their home in St. Denis had been destroyed.

It seems to have been the fashion in those days to visit the sins of the fathers on their wives and children, and as Dr. Wolfred Nelson had taken part in the hostilities his house was ordered to be burned. Strangely enough that same Dr. Wolfred returned to Montreal after the amnesty of 1847 and became eventually mayor of the city. He died in 1862, and his son Wolfred soon followed him to the grave.

Of the five original members, Arnoldi, Badgeley, and Sutherland were Protestants, Munro and Nelson were Catholics, and the minutes of the meetings during Dr. Sutherland's tenure of office were drawn up in English and when Dr. Bibaud became a member of the corporation there were three on each side and all worked harmoniously at the task they had undertaken.

The Act of Incorporation was not granted without imposing serious obligations. The professors were required to give 120 lectures a year in both languages, a feat that few of our present time teachers would like to attempt, and each member was personally responsible for the debts of the institution. On the other hand the certificates issued by the school entitled its graduates to receive from the Governor-in-Council a license to practise, a privilege which was annulled two years later in 1847 by the incorporation of the College of Physicians and Surgeons.

It was then that an agreement with McGill was reached, by which graduates of the school were admitted to the final year of the sister faculty, and upon receiving their diploma were entitled to the licence of the College of Physicians and Surgeons. By this understanding the school ceased its teaching in English, and three new professors were appointed; Dr. Pelletier to the chair of Institutes of Medicine, a rather comprehensive title; Dr. Coderre, first to the chair of Botany, and afterwards to that of Materia Medica; and Dr. Boyer to that of Medical Jurisprudence. At the same time students of the school were admitted to the wards of the Montreal General Hospital, for we find Drs. Badgeley, and Arnoldi teaching respectively clinical medicine, and surgery.

Things might have gone on thus indefinitely, but the new members of the corporation were naturally desirous of obtaining the right to grant degrees in medicine, or at least a certificate *ad praticandam,* as the phrase went. They decided in consequence to apply to the Legislature for powers to that effect, and this brought about the resignation of Drs. Arnoldi, Badgeley, and Sutherland, who were in favour of leaving matters in *statu quo.* We cannot blame them for this, as the *entente* with McGill, had in all probability been obtained through their efforts; but on the other hand, their colleagues, if gifted with less foresight, were quite sincere. This must have happened in September or perhaps August, 1849, for we find a notification was sent to the Governor-in-Council of their resignation and of the appointment of Drs. Trestler, Beaubien, and Trudel as duly elected members of the corporation in lieu of the three who resigned.

The bill, the cause of all the trouble was pre-

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sented to the Legislature at Toronto, for we must remember, that the Provinces of Quebec and Ontario were united under one parliament since 1840. It was withdrawn by its promoter, probably on account of overwhelming opposition, and a similar attempt at Quebec in 1853, met also with defeat. The first move led to a rupture with McGill, and till 1867, graduates of the school had to pass an examination before the College of Physicians and Surgeons, to obtain their licence. We might also add that two requests for affiliation with Laval at Quebec were refused.

As the school had no further access to the Montreal General Hospital, they turned to the Hotel-Dieu, and thanks to the good offices of Dr. Munro, the community physician, the wards of that institution were opened to the students, and the professors were named attending physicians. Not long afterwards came the second cholera epidemic, and night after night the professors ministered to the sufferers brought in after their daily visit.

Dr. Trestler soon retired and was replaced by Dr. d'Orsonnens, who remained a member till his demise in 1892.

As time passed, the building on St. Urbain Street was found to be unsuitable, and I believe also that there was a fire, which decided the removal to a house situated at the back of what had once been a garden, for a fountain stood near the entrance on Lagauchetière Street, between Clark and St. Urbain. The site is now occupied by Chinese clubs, and the Montreal Water Works Department. In 1870, the faculty leased the old Quesnel mansion on Craig street, near Coté Street. This was demolished this year to make way for the Tramways Building. Finally a more suitable edifice was erected on Pine Avenue with funds which were loaned by the Hotel-Dieu; this took place in 1874.

In 1867 the school was affiliated with Victoria University in Cobourg, and was enabled in this way to secure degrees for its graduates, and were thus relieved of the humiliation so long endured of having to send its students to the examinations of the College of Physicians and Surgeons for their licence.

In 1877 negotiations were opened with Laval, and a Succursale or branch of that institution was founded in Montreal. It included all the members of the school and a few others.

As often happens when important matters are settled without due consideration, and careful examination, the members of the school accepted *en bloc* the rules and regulations of the parent university, and when difficulties arose they found themselves excluded by the University Council, as they had acepted in advance such a revocation for reasons judged sufficient by the said council. Meanwhile, the Rector of Laval founded a separate faculty, and henceforth there were two French teaching bodies in Montreal. This was in 1878.

During the five years that followed there was, of course, much rivalry between the two faculties, but as the old school had the sympathy of the profession, its students numbered about 150 while the Succursale had comparatively very few.

In 1883, matters came to a crisis, and as I had been elected a member of the corporation of the school the previous year, I have a very vivid recollection of what happened.

There were but three of the original French members left: Dr. D'Orsonnens, the president; Dr. Coderre, the secretary and Dr. Trudel. The more recently elected members were: Drs. Durocher, Hingston, Craig, Beaudry, Brunelle, Desjardins and myself.

The authorities at Quebec, headed by Archbishop Taschereau believing that our opposition to the Succursale was an act of disobedience to Rome, enjoined us under ecclesiastical penalties to break our affiliation with Victoria and to cease teaching. At the same time we were, by episcopal orders, excluded from the Hotel-Dieu, and other hospitals, so that, to say the least, we were in a precarious situation.

I have no doubt but that the authorities in Quebec and Montreal were in perfect good faith, but their views did not coincide with those of the authorities at Rome. When all seemed lost, we delegated Dr. L. E. Desjardins to lay our case before the propaganda, and in less than two weeks after his arrival in Rome a cablegram authorized by Pope Leo XIII suspended all censures, and restored us all our rights.

Then, till 1889 the two faculties continued the struggle, till a *modus vivendi* suggested by Leo XIII, and embodied in the Bull, "*Jamdudum*" came as a welcome relief to all concerned.

The school retaining its corporative rights, became the Laval Medical Faculty in Montreal, and admitted the professors of the Succursale as members. This, of course, was not effected without an appeal to the Legislature, and the promoters of the bill had, for a year, an anxious time for their action was at first misunderstood.

At last in July, 1891, the united faculties met, elected their officers, and when they came to know each other better, harmony soon reigned, and the years from 1891 till 1919 were happy and prosperous in every respect. Our relations with Laval in Quebec were most cordial, the gentlemen of St. Sulpice provided us with the building on St. Denis Street, and when at last it was decided to found a separate university in Montreal, some of us would quite as gladly have remained as we were.

At the final meeting of the school, November 21, 1919, of the twenty-two who had met around

the Council table in 1891, there were but two survivors, Dr. Foucher of the original Succursale and myself of the old school.

We agreed to surrender our charter, and to be merged into the new university. Strangely enough the following evening a disastrous fire destroyed the halls and laboratories where we had worked so long, and everything had to be begun anew.

Such is the history of the Ecôle de Médicine et de Chirurgie de Montreal, from its foundation in 1843, till its disappearance in 1919.

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## HISTORY OF PERNICIOUS ANÆMIA*

By H. Beaumont Cornell, M.B.

*Belleville, Ont.*

The first exact description of the type of anæmia designated as pernicious was given by J. S. Combe of Edinburgh in 1882. The observer described certain of the most common of the clinical features as extreme pallor, blue sclerotics, weakness and langour, dyspnœa on exertion, weak pulse, and gastro-intestinal disturbances and in addition gave an accurate account of the post mortem findings: the yellow subcutaneous fat, the pale flabby myocardium, the liver of light brown colour and the soft spleen.

Channing of New York in 1842 was the first to describe a pernicious type of anæmia occurring in puerperal cases, the chief distinction from the ordinary form being that a few entirely recovered by way of their first remission. Elliotson's "Practice of Medicine," 1846, refers to certain cases of grave anæmia, which from his description were probably Addisonian. He advocated iron in treatment and suggested a theory of etiology, based on an idea of compensatory congestion and anæmia occurring simultaneously in different parts of the body, due to the effects of emotion or gravity.

Before and during this period Thomas Addison, physician to Guy's Hospital, London, had become keenly interested in a group of cases presenting pallor and asthenia. From among these cases he was able to describe two diseases, one which he termed idiopathic anæmia and the other the disease we know as Addison's disease of the suprarenal glands. His vivid description of the clinical picture of the idiopathic anæmia is contained in Osler's Text-Book of Medicine. He noted its insidious onset in the middle period of life, and the retention of body fat that occurs in the disease. Addison believed that some form of fatty degeneration played a part in its etiology. This brief but very clear description placed pernicious anæmia on a fairly firm basis as a clinical entity and a distinctive disease. Barclay in 1851 first described the glossitis now regarded as a feature of the disease.

Wilks in England, Trouseau in Paris, Austin Flint in New York, and Osler's old teacher, Palmer Howard, in Montreal described the disease and taught it to students in the sixties. Sir Wm. Gairdner of Glasgow in his "Clinical Medicine" (1862) recorded a case of the disease, noted its distinction from chlorosis and its resemblance in its clinical manifestations to malignant disease. Perroud (1869) earliest of the French school to observe the disease emphasized the fatty transformation of the liver as the etiological factor, and the anæmia, cachexia and œdemia he regarded as the results.

It is unfortunate that despite Addison's classical description real interest in the disease not only on the continent, but in the British Isles was first aroused by Bierner of Zurich, whose description contained nothing which Addison did not mention, except the tendency to small hæmorrhages, but which did possess the fallacy of including under this disease a group of cases arising from malaria, carcinoma, and infection by the *Bothriocephalus Latus*. He noted the poor prognoses of these cases, and first ascribed to the disease the term primary progressive pernicious anæmia. His work was original and important, his description excellent. Addison however, was later accorded, even by continental writers, the priority he deserved. Pye-Smith, a pupil of Addison, in an article in Virchow's *Archiv*, (1875) drew the attention of Germany to his master's work. Later in 1883, he published in Guy's Hospital Reports, a conclusive vindication of the identity of this disease and deprecated the tendency to merge it with other anæmias in Bierner's group of "progressive pernicious anæmia." Even at the present day, however, there are not a few who readily apply the term "pernicious anæmia" to those cases of gastric cancer, malaria, pregnancy, dibothriocephalus infestation and tertiary syphilis, in which the blood presents a striking resemblance to that seen in the Addisonian complex. (*Harvey Club Bulletin*, Oct., 1926.)

* Excerpts from a paper presented to the Harvey Club of London.

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# Correspondence

## Our London Letter

(*From our correspondent*)

*The University of London Bill.*—In December at the close of the session of parliament the "University of London Act" received Royal Assent and it comes into force immediately. Anyone who has endeavoured to follow the politics of London University, particularly where the medical faculty is concerned, during the past few years will probably be more mystified than ever by the new Act which the representative of the medical faculty on the Senate, Dr. Graham Little, who also represents London University in parliament, has opposed throughout! London University to an outsider has always been a little difficult to understand, for to begin with, there is no real central university building, the various administrative offices being for the most part "lodged" in the Imperial Institute which is largely a collection of museum rooms. The various colleges and medical schools which go to make up the university have largely kept their own autonomy, but of recent years many from financial causes have been drawn more and more under the control of the central organization. The supreme body in all matters financial and academic is the Senate and before the Act this consisted of fifty-five members, of whom seventeen were nominated by the Crown or by bodies which have nothing officially to do with teaching. The future Senate will be a body of forty-eight, of whom twenty-five will be directly concerned with teaching, sixteen will be as at present the guardians of the interests of external students and five will be co-opted by the Senate. Dr. Graham Little believes that the medical schools in London will suffer under the new Act since there is going to be, he states, much more interference with the appointment of the principal teachers, which, he fears, may include members of the staffs of the various hospitals. Sir Wilmot Herringham replies to the effect that the alterations in the constitution of the University will be thoroughly advantageous, and that the medical schools have already submitted to such interference without obvious harm, since there are now in London over thirty professors appointed by the university to the medical schools, whereas there was not one before the war. Here are two eminent medical men in conflict, and it is no small wonder that medical graduates of London University are for the most part thoroughly mystified as to what the new Act is really going to do.

*Experiments on stolen dogs.*—The practice of vivisection in this country is conducted under most stringent regulations, licences being necessary for all animal experimentation and inspecting officers pay frequent visits, usually without previous notice, to all places registered for experiments. Nevertheless the anti-vivisectionists are always on the look out for something to justify their sweeping assertions of cruelty. They were recently afforded an opportunity for their activities by a case in London, where a man was convicted for receiving two stolen dogs which he stated he was taking to University College Medical School. Certain remarks were made by the magistrate in the case and the college authorities promptly issued, an explanation. This has not stopped, however, a flood of questions in parliament; and letters have been sent to the press by both sides. Finally a summons against another man for stealing a dog and against Prof. Verney for receiving the dog were dismissed, the magistrate in this case remarking that the prosecution ought never to have been launched. The whole affair, unpleasant as it has been for those directly concerned, has, however, brought out certain points of interest. For example, an indefatigable anti-vivisectionist, Stephen Coleridge, wrote to the *Times* to say that since the death rate from diabetes, as shown by the returns of the Registrar General, was increasing it was obvious that insulin was without value in the treatment of this disease, and hence animal experiments in connection with the production and standardization of this substance had no justification. Such arguments show only too clearly the weakness of the anti-vivisectionists' position. Further, Prof. A. V. Hill has shown that over 50,000 stray, homeless and unwanted dogs are destroyed every year, there being a clause in the "Dogs Act" of 1906 preventing stray dogs from being used for vivisection purposes. There is strong feeling that the solution of the difficulties under which many physiologists have to work would be found by repealing this clause.

*The Society of Apothecaries.*—It may sound quaint to people outside the British Isles to learn that the Society of Apothecaries is still a very active body, having power to examine candidates for a licence which entitles them to practice medicine. The Master and Wardens of the Society recently gave a dinner at their hall and presented Prof. W. E. Dixon, of Cambridge with the Society's Gold Medal for Therapeutics. The presentation was made by the Master, Dr. Alfred Hepburn, and in his speech he outlined the development of the medical profession. In this connection the history of the Society of Apothecaries is of great interest. The physicians of London became incorporated in 1518 and the barber-surgeons in 1540 but a great

number of more or less irregular practitioners still remained outside these bodies and in April, 1606, James I. incorporated the apothecaries as one of the city companies, uniting them with the grocers. Their charter was renewed in 1617 and they became a separate corporation under the title of the "Apothecaries of the City of London." In 1748 great additional powers were given to the company by an act authorizing it to appoint a board of examiners without whose licence no person should be allowed to dispense medicines in London or around it. By several subsequent acts the licentiates of the Society became authorized to practice medicine and this was confirmed by the Medical Act of 1886, when registration as fully qualified practitioners became possible by those who held the licence of the Apothecaries Society. The Society is governed by a Master, two Wardens and twenty-two assistants and has a hall in Water Lane, London, rebuilt after the great fire and enlarged in 1786.

ALAN MONCRIEFF

## A CANADIAN DR. MACLURE

TO THE EDITOR:

Your readers will doubtless remember the story as told by Ian Maclaren, in *A Doctor of the Old School* of the heroic drive of Dr. "Weelum" MacLure to see Mrs. Annie Mitchell. Similar stories could be told of many members of the profession in Canada. Here is one. On or about November 5th last, an obstetrical incident, which in my opinion is worth recording, took place at Sand Point, Lake Nipigon, twenty-three miles from Nipigon by water and about thirty-five miles by trail. Owing to the depth of snow, the trail was impassable, so there was no way of getting there except by boat. The patient was unmarried, the cause of the trouble was an Indian—Pete Gonyea. Mrs. Gonyea had undertaken to attend the girl in her confinement, but complications developed, and it was necessary that a doctor should be brought immediately. Pete Gonyea managed to reach Nipigon to try and get Dr. E. D. Brown to go. It was blowing thirty-five miles an hour, snowing and freezing. To go back by trail was impossible, and to go by water was dangerous. The government patrol boat was undergoing some repairs and to put it in order would involve a delay of three or four hours, so another man was persuaded to take him in a smaller boat. Those who saw them start were convinced that they would never return, but Dr. Brown insisted on making the attempt. He reached Sand Point and remained there until daylight, and was successful in bringing the case through. He knew before he left home that he would get no financial returns for the trip and that he was taking a tremendous chance as far as his own life was concerned. Such heroism should receive some notice.

Yours truly,

R. G. HINTON,

*Captain, Government Patrol Service.*

# Reports of Societies

## CLINICAL MEETING OF MEDICAL OUT-DOOR STAFF, TORONTO GENERAL HOSPITAL

### EXHIBITION AND DISCUSSION ON CASES SEEN IN THE HOSPITAL

At the clinical meeting of the staff of the out-patient department of this hospital on December the 15th, the problem of *the diagnosis of chicken pox* was brought up by Dr. Young, apropos of the appearance at the clinic the week before of a coloured man, whose body was thickly covered with a rash which was so crowded on the face as to suggest at once small-pox. The man seemed seriously ill, had high fever, was nauseated and was vomiting. Careful consideration of the case by the members of the staff present resulted in an even division of opinion, as to the nature of the disease before them; and the services of the board of health's diagnostic specialist were necessary for the correct interpretation of the confusing symptoms. By him the case was pronounced one of chicken-pox, and noted as being one of exceptional severity. Suggesting small-pox was the backache, the vomiting, the extensive eruption on the body, face and scalp, and the papular and shotty feeling of the early lesions. Contrariwise, however, were the following facts: the man had been successfully vaccinated within three years; within forty-eight hours of the onset of his illness his body and face were covered with lesions; and when first seen the early lesions had already become pustules; there were many spots still in the hard papular state with others in the beginning vesicle state. Thus the succession of crops so to speak, was in evidence even by the second day. The pustules broke easily on pressure leaving an excavated clean ulcer; many had already broken off themselves, and the partitioned lesions of variola were not to be made out; there

were no lesions in the mouth, and none on the soles of the feet or palms of the hands: the fronts of the legs, and the extensor surfaces of the arms were not extensively affected when the man was first seen. A further point against the diagnosis of small-pox was the absence of splenic enlargement and the existence of a leukopenia.

*Dr. Young* spoke of the difficulties in the diagnosis between small pox and chicken pox, particularly in a case of this sort with abundant lesions, umbilicated and pustular, crowded into the scalp and onto the face; the appearance was almost enough to convince one that he was dealing with a case of confluent small-pox; it was not until the history was weighed and the papules and vesicles actually handled that the correct interpretation was made. An eruption out and well developed in two days was not variola; broken vesicles and vesicles well merged into one another by forty-eight hours would not be looked for in this disease; the early appearance of the eruption, the succession of crops, the fragile vesicles all spoke for varicella, as did also the intense itching of the skin. "Shottiness of a rash" was commented on by those discussing the details of this case, and the opinion was expressed that this valuable clinical point was probably a very difficult one to evaluate as small-pox rashes are so rarely met with in general work.

*Dr. H. S. Hutchison* presented for Dr. Coatsworth a detailed report on the results obtained in cases of *enlarged thyroid* by the administration of thyroid extract; it was difficult he said to speak with certainty on such a subject in an out-door clinic, but the results of the careful measurements systematically made by Dr. Coatsworth seemed to show that a progressive diminution in size of many glands was obtained. One point was to be stressed; these patients can take what seems an enormous dose of the dried gland without inducing apparently any unpleasant results.

*Dr. Gordon Bates* shewed the x-ray plates of the skull of a man who had come complaining of *persistent* and *recurring headaches* of the migrainous type, and an extreme degree of polyuria; the report of the radiologist spoke of "a marked thickening of the anterior clinoid process" and he was anxious to get the opinion of those present as to just what import was contained in these words. Dr. Lougheed remarked that at autopsies thickening to a greater or less degree was a common finding, and that the report of the radiologist though accurate might not be of importance; it might be merely an anatomical peculiarity.

*Dr. Young* shewed also a case with a *small epigastric hernia;* this hernia though so small as to be overlooked unless the epigastrium was carefully palpated or unless one got the abdomen in profile, was, he thought, the cause of a group of symptoms highly suggestive of gastric or duodenal ulcer. Complete radiological examination had revealed nothing, yet the man had seemed severely ill and the only suggestive finding had been this small hernia. Dr. Young was of the opinion that incarceration of the hernia might, by dragging on the mesentery, produce the acute pain complained of, particularly if it was the stomach that was herniated. In the discussion which followed it was noted that an occasional instance of this sort had already come before the clinic, and it was suggested that a picture in profile after a barium meal might show a filling of the hernia proper; the propriety of an operation for the relief of symptoms was proposed, although it was generally recognized that large epigastric herniæ presented notoriously unsatisfactory conditions, when it came to the question of surgery.

*Dr. Plewes* presented a remarkable case of *acute muscular atrophy* with the history of an unusual rapid progression. The patient, a plasterer, had complained of weakness of the left arm for one month, interfering with his occupation as a plasterer, which necessitated the use of his shoulder muscles to great extent; there had been no exposure to lead or to other poisons; he had had no infections save diphtheria thirty-five years ago. This may have had something to do with a symptom of many years standing, namely, a difficulty in swallowing, which though not enough to interfere with his nutrition, was nevertheless something of which he was always conscious. The weakness of the arm was progressive, and he could only with difficulty keep at work. Though a well built and developed man elsewhere in the body, the atrophy of the muscles of the left shoulder girdle was in striking evidence; the trapezius, the rhomboids, and the deltoid were practically gone and the scapula stood out like a wing; there was a great muscle ball in the place of the supraspinatus; fibrillation was a continuous performance in all these muscles. The muscles of the right shoulder showed some atrophy, but in them there was no fibrillation. A point to be noted was that the muscles of the hands were not involved. The abdominal muscles in the flank areas were unusually thin and wasted for a man of his size and build; he had no recollection, however, of there being any change in their condition.

One month later he shewed distinct wasting of the triceps and biceps, and evidence of wasting in the muscles of the right shoulder joint was pronounced; his arms at present were almost useless for certain of the shoulder movements. There was also a suggestion of atrophy of the glutei; the small muscles of the hand remain unaffected. The reflexes were all weakened. There was nothing helpful in the

reports of the blood or urine. It had not been thus far possible to have reports on the existence or non-existence of reactions of degeneration. Dr. Plewes felt that the rapid development in this case placed it amongst the atrophies, rather than in the class of dystrophies. Acute muscular wastings in adults were after all, usually of central and spinal origin; chronic anterior polio-myelitis explained the majority of these cases; the fibrillation was a feature of the muscular atrophies. In the absence of any signs of an infection preceding the onset of the paralyses it did not seem likely that an acute anterior polio-myelitis had been the determining cause of the atrophy. There was no question as to the progressive nature of the affection. It would be of interest to speculate as to the relation of the slight bulbar symptoms which had existed for years to the present rapidly progressing condition.

*Dr. Thompson* presented an Italian with the blood picture of a *primary pernicious anæmia;* interesting features of the case were the facts that he had had malaria in his early days, and had now a spleen much larger and harder than is usual in pernicious anæmia; his liver was also easily palpable; the blood had a very high percentage of eosinophiles (4 per cent) and there were many stippled cells. The patient had been on a very starchy diet for all of his life, and the question of treatment would have special interest, for an effort would be made to start him on a high protein intake. Dr. Duncan Graham spoke on the results seen in the wards when this method of treatment had been employed; it was early yet, he said, to say much of the Minot method, but the improvement on the diet of proteins such as liver and the iron containing vegetables was often marked.

N. B. GWYN

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## MEDICAL SOCIETY OF NOVA SCOTIA
## HALIFAX BRANCH

A largely attended clinical meeting was held at the Victoria General Hospital on the evening of November 24th. Before proceeding with the programme, appropriate reference was made to the death of Dr. Vernon L. Miller. A number of very interesting cases were then presented by members of the surgical staff of the hospital. The first case was that of a man, aged fifty-four, just admitted to the hospital, and not yet investigated by the laboratory men. There was very extensive ulceration of the tongue, which had progressed slowly, with little evidence of metastasis. History in respect of venereal infection was not clear. Dr. Curry, who presented the case, discussed the diagnosis, naming several possible conditions, and asked for the opinion of others. Dr. MacDougall thought that the diagnosis lay between malignant disease, tuberculosis and syphilis, and inclined to the belief that it was syphilis. Dr. Murphy referred to a case he had had in which malignancy and syphilis were both reported by the laboratory, but which cleared up completely under iodide treatment. Dr. A. I. Mader thought that Dr. Curry's case was one of malignancy, probably of basal cell type—which would account for lack of metastasis.

Dr. MacDougall showed a patient upon whom he had recently performed a thoracoplasty. After discussing the indications for the operation, he said that success depended much upon the condition of the patient, who should be able to react well and in whom the disease should be inactive and confined to one lung. The x-ray plates, demonstrated by Dr. S. R. Johnston, showed the result of the operation to be very encouraging. Dr. A. I. Mader expressed the opinion that the operation is really justifiable in less favourable cases; and that emphasis should be laid on the saving of life rather than on keeping down operative mortality.

Dr. Murphy presented a girl in whom an adhesive tuberculosis peritonitis had been greatly benefited by operation and exposure to sunlight. This type of case is not usually regarded as favourable for operation, but the improvement in his patient was noteworthy. Dr. Burris cited a similar case in his experience.

Dr. Mack demonstrated a patient suffering from papilloma of the bladder with hæmaturia; pointed out the clinical features and discussed the treatment. Several members referred to the comparatively low malignancy of bladder cancers, one case being cited in which the patient lived ten years after a palliative operation and then died from an intercurrent condition.

After adjournment, Mr. Kenney, the Superintendent of the hospital, entertained the members at a delightful supper. On being called upon for a speech, he contrasted present conditions in the surgical wards with those of thirty years ago, when pus was common, and when the average stay in hospital was twice what it now is.

At the meeting held on the eighth of December, Dr. Lawlor, Medical Superintendent of the Nova Scotia Hospital, read a paper on "Hospitalization of the insane." He sketched rapidly the developments of the last quarter of a century, and pointed out that satisfactory institutional treatment of the insane demanded much the same diagnostic armamentarium as that which has come to be regarded as essential in the modern general hospital, and also facilities for hydro-therapy and occupational therapy. It is difficult to impress these needs

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upon the public authorities, who are still inclined to accept the popular opinion that the main function of the hospital for the insane is to provide custodial care. As such a hospital is usually owned and controlled by the state, the extent to which equipment is provided is determined to some extent by the attitude of the public. Dr. Lawlor suggested that this, in turn, is determined by the attitude of the profession, and asked that medical men use their influence in stimulating a favourable interest on the part of the public.

The Committee which had been appointed to consider and report upon Dr. Weatherbe's presidential address (which had dealt principally with medical education) submitted a report for discussion. The discussion proved most interesting, a considerable variety of opinion being expressed. There appeared to be practical unanimity relative to the undesirability of subjecting recent graduates to repeated examinations by licensing bodies. The Committee was asked to continue, and Dr. MacDougall requested that its members (Drs. K. A. MacKenzie, Corston and Burris) should join the Committee on Medical Education of the Canadian Medical Association, of which he is Chairman.

VICTOR O. MADER

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# Miscellaneous

## REGARDING TRANSFUSION AND INTRAVENOUS INJECTIONS

BY W. J. EGAN, M.D.

*Sydney, N.S.*

Few outside the medical profession, or we may say, within it, know that the architect of St. Paul's was the same Dr. Christopher Wren who was the originator of intravenous injections. It is true however that about 1667, a London scientist, Mr. Oldenburg, does declare that the discovery of a method of conveying liquors immediately into the mass of blood of an animal is due to Sir Christopher Wren, at that time Savillian Professor in the University of Oxford, and goes on to describe the method thus: "Wren's method was to make a ligature on the veins, and having made an opening in them on the side of the ligature towards the heart, to introduce into them slender quills fastened to bladders (in the manner of clyster-pipes) containing the matter to be injected; performing the operation upon pretty big and lean dogs in which the vessels might be large enough and easily accessible. These experiments were made at different times upon dogs. Opium and the infusion of crocus metallorum were injected into the hind legs of these animals. The opium soon stupified but did not kill the dogs; but a large dose of the crocus metallorum* induced vomiting in all and death in some of them."

These experiments mentioned by Oldenburg were more fully related by the Hon. Robert Boyle, probably the most profound English scientist of that age, in his excellent book on the *Usefulness of Experimental Philosophy.*

About this time too, there was an international contention regarding the history of transfusions; several countries claimed to be the pioneers, but in the end the discussions revealed that Italian scientists, and probably Frenchmen too, had been acquainted with such operations before Sir Christopher Wren had been born, and that long before Wren's work, transfusion from dog to dog and from lamb to lamb, as well as transfusions of various liquids, had been quite commonplace operations. Soon the scientific world, through the success of these transfusions began to dream of the possible rejuvenation of older animals, human or otherwise, through the injection of the blood of younger ones; an attitude possibly less erratic than that exhibited by the more modern advocates of monkey glands.

The following experiment by Signor Griffoni, at Undina, Italy, on the 20th of May, 1667, is well authenticated, in which an old deaf mastiff certainly appears to have benefited by the treatment: "This dog, thirteen years old and deaf for some three years, was so feeble that he walked very little, and was so unable to lift his hind feet that he could only trail his body forward. After Signor Griffoni had transfused the blood of a lamb into his veins, he remained for an hour upon the table where he was yet untied; but leaping down afterwards, he went to find his masters who were in other chambers. Two days afterwards he went abroad and ran up and down the streets with the other dogs, without trailing his feet as he did before. His appetite also returned to him and he began to eat more greedily than before. But what is the more surprising is that from that time forward his hearing began to return, so that on the 13th of June he appeared to hear quite well, answering the call of his masters."

About that time too, a certain Mr. Denys, Professor of Mathematics and Natural Philosophy at Paris, states in a letter to Mr. Oldenburg, who was then in London, that they recently in Paris

*Was crocus metallorum an oxide of iron?—W.J.E.

"transfused the blood of four wethers into a horse twenty-six years old, and that this horse had thence received much increase of strength, and more than ordinary appetite."

To show you that our professional forebears of that time were very human like ourselves, quite a heated international discussion arose as to which country, England, France, or Italy was the first to report transfusions into the veins. In the end Dr. Boyle satisfies himself as to the Italian claim in the following statement: "An Italian philosopher in a tract entitled *Relatione dell esperienze fatte in Inghilterre, Francia and Italia, intorno la transfusione del sangue* lately printed in Rome, undertakes to prove that the transfusion is of yet greater antiquity, as having been known to Libavius above fifty years since (or about 1615). The Roman author quotes a paragraph out of the said Libavius. (*In defensione syntagmatis arcanorum chymicorum contra heningum schneumannum, actione 2 Frankof A.D., 1615*), where the transfusion is so plainly described, that one can hardly discourse of it with more clearness than is there done in the following words: "*Adsit juvenis robustus sanus, sanguine spirituoso plenus: adstet exhaustus veribus, tenuis, macilentus, vix animam trahens. Magister artis habeat tubulos argenteos inter se congruentes, aperiat arteriam robusti, et tubulum inserat mumiatque; mox et aegroti arteriam findat, et tubulum foemineum infigat. Jam duos tubulos sibe mutuo applicet, et ex sano sanguis arterialis, calens et spirituosus saliet in aegrotum, unaque vitae fontem afferet omnemque languorum pellet.*" This indeed is clear enough and obliges us to allow a greater antiquity to this operation than we were before aware of; though it is true that Libavius did not propose it, but only to ridicule it; besides he contrives it with great danger to both the recipient and the emittant, by proposing to open arteries in both; which indeed might be practised upon brutes, but ought by no means upon man.

## MERCUROCHROME

The following comments on mercurochrome are taken from the *British Medical Journal* of November 27, 1926. "In the case of this dye there is a very considerable quantity of favourable clinical evidence, which has come from several different countries. Mercurochrome-220, or di-brom-oxymercuri-fluorescin, was introduced in 1919 by Young, White and Swartz. The number attached to the name indicates its place in a series of disinfectants examined by these workers at the Brady Urological Institute, Baltimore. The drug has been found to be a general disinfectant of high value, and when applied in 2 per cent solution to open wounds or mucous membranes it exerts a powerful and prolonged disinfectant action and produces little local irritation. The action of the dye as an internal disinfectant has, however, attracted especial attention; it is given intravenously in 1 per cent solution doses up to 5 mg. per kilo body weight. The drug has been tried in a large number of different types of infection, and some very remarkable results have been recorded. In a recent communication Young gives records of 680 cases treated with mercurochrome-220. His records show that in 173 cases of septicæmia a cure was effected in 63 per cent. Successful results are also recorded in leprosy, anthrax, and malaria. In acute encephalitis his records show that five cases were treated and that all were cured or improved, but that in residual cases no improvement occurred. The drug was used by Dr. Dunn in the second case of polio-encephalitis at Uppingham School. A single intravenous injection, given within a few hours of the onset of symptoms, was followed by an immediate improvement, and on the fourth day the boy was convalescent. Young did not find much benefit to follow the use of mercurochrome in ten cases of meningitis. Others have given rather less favourable reports than Young of its action in various diseases, but most observers are agreed that the drug often produces remarkable benefit, even in severe cases of generalized infection. The drug is, of course, a powerful agent, and therefore can produce undesirable side-actions. The most unpleasant side-action is a painful colitis due to the action of mercury on the gut. Some workers also have accused the drug of producing kidney injury—an effect that is likely to follow the intravenous injection of any organic mercurial drug if given in large doses. Young denies, however, that this is a serious danger if proper care is exercised. Time is of course needed in order to arrive at a final estimate of the value of any new drug, but the evidence existing regarding mercurochrome-220 is sufficient to entitle the drug to the careful consideration of the medical profession in this country."

## HYDRATED MORPHINE DERIVATIVES

The action of most drugs on man is by no means localized to the particular tissue whose function we may desire to stimulate or depress. It may be hoped, however, that close co-operation between the organic chemist, the experimental physiologist and the scientific clinician, will give us chemical substances whose actions are more selective and which may on this account be of greater value in the treatment of disease. The *Lancet* in a recent number calls attention to the hydrated derivatives of morphine, an account of which has been contributed by Professor Erich Leschke. "The derivatives chosen for investigation were Paracodin (dihydrocodeine), Paramorfan (dihydromorphine), Dicodid (dihydrocodeinon), Dilaudid (dihydromorphinon), and Eukodal (dihydrooxycodeinon).

"Dihydrocodeine has been found to be much more active in depressing the coughing reflex than codeine, which, as is well known, is itself relatively more active in this respect than morphine. Dihydrocodeine is also more specifically analgesic than morphine, in that the higher centres of the brain do not show that general depression characteristic of the action of morphine, and its constipating action is much less marked. It may be given by the mouth or subcutaneously. The pharmacological action of dihydrocodeinon occupies a position between those of codeine and dihydrocodeine. Its toxicity is approximately the same as that of morphine, but increasing tolerance is not nearly so marked as with the latter drug, a

fact which, according to Leschke, can be readily shown in animal experiments. Dihydrooxycodeinon is more nearly allied to morphine in its pharmacological effects in that its general narcotic properties are well marked; indeed, in this respect it is relatively more potent than morphine, and it has been used successfully in biliary and renal colic. Dihydromorphine has a similar action to that of morphine, but the effect lasts longer and the degree of tolerance developed to repeated injections is said to be decidedly less. Dihydromorphinon exerts its narcotic and respiratory depressant action in doses one-quarter to one-half that of morphine. Tolerance to the drug appears much less readily, its action on the gut is extremely small, and the danger of habituation is very much reduced. It is clear that if this information can be confirmed and extended by further experiment it must be recognized as a valuable contribution to pharmacology and therapeutics." (*Lancet*, December 11, 1926.)

## THE ORIGIN OF SYPHILIS

The problem of the first appearance of syphilis in Europe has been debated from the time of Christopher Columbus to the present day. From that date onwards there has been a wide-spread opinion that the disease was brought from America by the sailors of Columbus on their return in 1493. There is however no direct proof of this. In a recent work on the origin of syphilis Dr. Gaston Vorberg* has collected together all available evidence on the question. Supporters of the American origin of the disease rest their case upon the following alleged facts: that a pre-Columbian syphilitic bone has never been discovered in the Old World; that a violent epidemic of syphilis occurred at the close of the fifteenth century, an epidemic which synchronized with the return of Columbus from America, and apparently followed in the footsteps of Columbus' sailors. It is a remarkable fact that syphilitic bones previous to this period are practically unknown. Vorberg claims the same is true of America. Hrdlicka examined thousands of the skeletons of American Indians and failed to find an undoubtedly syphilitic bone. Vorberg mentions that two bones, a humerus and an ulna showing traces of disease which might be regarded as syphilitic have been found in a burial cave in the Petit Morin Valley, and are estimated to belong to men of the neolithic period; but no pathologist would we think commit himself to the assertion that bones of that period could be regarded as undoubtedly syphilitic. Taken by themselves it would certainly be unwise to attach great importance to them. On the other hand, a disease resembling syphilis undoubtedly existed among the mercenaries of Charles the VIII's disastrous invasion of Italy, by which his armies we are told were decimated. It can readily be understood that if syphilis existed at that time it might undergo a rapid increase both in severity and in the number of its victims as the result of that invasion. To the above the *British Medical Journal* (December 25, 1926) adds in an editorial, "There is some satisfaction in learning that the alleged syphilitic taint in Cæsar Augustus is not borne out by an exhaustive scrutiny of his numerous personal blemishes. It adds that unfortunately, the same cannot be said of Socrates. The author has given admirable photogravures of six different bust of Socrates, and the profile view of that in the Louvre, more particularly as regards the nose, almost compels the conviction that a true bill must be returned in this case. We would hesitate however to consider syphilis as the only possible cause of such a defect. Socrates himself was aware of the defect, for it formed the central point of the discussion between him and Kritobulos on the subject of beauty, 'Now take noses,' said Kritobulos, descending to personalities somewhat; 'would you consider yours or mine the finer nose?' 'Well,' replied Socrates, 'if the God of Noses made noses to smell with, there can, I think, be little doubt that mine is the superior of the two. Your nostrils are directed downwards, whereas my nose is tilted up, so that it can receive smells coming from all quarters.' 'But surely it is a mark of distinction to have a good bridge? Your nose is flat!' 'Yes, but with a nose like mine,' said Socrates, 'one is able to command a much larger segment of the horizon with each eye.' In such fashion was the genial sage wont to inculcate philosophic wisdom."

* *Uber den Ursprung der Syphilis.* Von Dr. Gaston Vorberg. Stuttgart: J. Puttmann; London: Peter Davies, Ltd. (Med. 4to, pp. 111; illustrated, 27s. net.)

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A plan is on foot to establish an Australasian College of Surgeons. At a meeting held in Sydney last August it was agreed that it was advisable to form a College of Surgeons of Australasia, and forty foundation members were nominated. They were asked to take steps to formulate a constitution, and to place their scheme before those surgeons who attend the Australasian Medical Congress which is to be held under the auspices of the British Medical Association at Dunedin, New Zealand, early in February. It is expected that a final decision will then be reached. — *Brit. M. J.*, Jan. 15, 1927.

# Abstracts from Current Literature

## MEDICINE

**Colitis as a Common Disorder of Digestion.** Kanton, J. L., and Sagal, Z., *Am. J. M. Sc.*, Nov., 1926.

The authors are discussing the milder forms of colitis, sometimes functional in character, often overlooked. They may accompany other conditions, and, unaided, may give rise to very disagreeable and troublesome symptoms. Almost any digestive disorder will be associated with a "faulty" colon, producing more discomfort than can be explained by physical findings. The phrase "stomach trouble" is apt to be misleading; even when the symptoms are aggravated by food, because of the anatomical relation of different parts of the alimentary canal and the ever present gastrocolic reflex.

The causes are many: (1) constipation in all its forms, and the inevitable use of a succession of cathartics. (2) Improper diet with disturbed gastric chemical reactions. (3) Adhesions. (4) Intestinal dyspepsia. (5) Disturbance of the autonomic nervous control of intestinal function.

The symptoms may imitate almost any abdominal disorder through distension of different segments of the bowel. Examination shows tenderness over some part of colon; the proctosigmoidoscope reveals free mucous and various changes in the mucosa; the fæces show mucous, fermentation bubbles, and are strongly acid with sour odour. The x-ray picture of colitis cases shows abnormal irritability resulting in a much faster movement of the barium, there are also changes in the contour of the colon such as a filling defect of the proximal colon and increased gas content. Treatment of such a chronic condition must of course be persistent and painstaking; a well-balanced diet, of a simple, bland nature; cold foods and drinks are to be avoided. The improvement can be gauged by the condition of the stools. Usually there is an underlying neurotic depression which should be kept in mind and managed tactfully.

P. M. MacDonnell

**Roentgen Ray Therapy in Erysipelas.** Platou, E. S., and Rigler, Leo., *Arch. of Int. Med.*, Nov., 1926.

The authors begin their article by stating that there are probably few diseases known to man which have caused so much speculation regarding treatment as erysipelas. They refer to the numerous local applications which are advocated for its treatment including ultra violet radiation. The difficulty in estimating the benefit derived from any measure, is due to the well known fact that erysipelas is a self limited disease.

As little work had been done on the effects of Roentgen ray therapy, the writers decided to try out a series of cases, and compare them with a similar series of control cases. They realized that in such a self limited disease any form of treatment to be adjudged effective, must be done in a very prompt and definite manner. They attempted to give their treatments over as short a period, and as soon as possible, after the onset of the disease. Eighteen control cases treated by the local application of iced magnesium sulphate and glycerine packs were compared with twenty-three cases treated by the Roentgen ray.

The facial cases were divided into four areas of exposure, one anterior, over the face and forehead; one on each lateral surface of the face and neck, including the ear, and one on the scalp. The first three areas were always treated regardless of whether they were all involved or not, in the hope of preventing the spreading of the disease to the normal areas. The area over the scalp was treated only when invasion or threatened invasion was in process. In the case of erysipelas in other parts of the body, the affected area, together with a large border of normal skin around it was treated in the same way, the part to be treated being divided into contiguous areas of approximately 300 sq. cm.

In the eighteen control cases, there were four deaths, while only one death occurred in the twenty-three cases treated by Roentgen ray. In the control cases the period of elevated temperature averaged five days while in the latter group, the temperature was normal in from one to two days. The temperature in the majority of cases dropped to normal within twenty-four hours after exposure to x-ray. Practically all the controls showed a spreading of the process to contiguous areas after treatment was begun, while only one of the Roentgen ray patients showed extension.

It was found that the duration of the disease from the time of Roentgen ray treatment to clinical cure was from two to five days, with an average of three days. In the cases treated in a routine manner four to twenty-one days elapsed, with an average of nine days. When the patients were looked at in a general way, with regard to details of temperature and clinical course, it was apparent to all those who were in contact with them, that the patients receiving Roentgen ray treatment improved far more rapidly than the patients receiving routine treatment for erysipelas.

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No deleterious effects of irradiation of the skin were noted. It appeared that the erysipelatous skin was more resistant to irradiation than the normal skin. As to the actual cause of the beneficial effect that was observed, the writers assumed that it was due to some change in the circulation, possibly to some action on the capillaries. L. C. MONTGOMERY

**The Communicability of Rheumatic Disease.** Abeloff, J. A., and Sobel, I. P., *Arch. of Pæd.*, Sept., 1926.

This paper sums up evidence collected both from the literature and from the authors' experience, regarding the possibility that rheumatic disease is communicable. They include under the term, acute rheumatic fever, chorea, and rheumatic heart disease.

Experimental evidence is not available, since we do not know what the causative agent is. On the whole, observations point to the fact that the disease occurs in epidemic form, and also, that the temperature and rainfall are of considerable importance in determining the incidence.

There is much to show that it may be a house infection to a certain extent, but whether this arises from the physical conditions, or is due to personal transmission, is not yet certain. A review of the literature shows that the family incidence of the disease is strikingly frequent. This point was first brought out by Garrod and Cooke in 1888, when it was found in a series of 500 non-rheumatic patients that only 21 per cent gave histories of cases of rheumatic fever in their families, but in a series of another 100 who had family histories of rheumatic fever there were 35 per cent with rheumatic heredity. Cheadle concluded from a study of 592 children that with a family history of acute rheumatism in immediate blood relatives the chance of contracting acute articular rheumatism is nearly five times as great as if there was no such hereditary taint. Many other series of cases have been gathered, and the authors now add their conclusions drawn from a study of 241 families, representing 828 people.

These were classed in two groups, one including families with previous cases of rheumatic infection, and the other in which apparently the disease had appeared for the first time. The analysis shows that of the "rheumatic" families, 25 per cent had one or more members with rheumatic disease; whereas only 14.7 per cent of the families in the second group had one or more members with the disease. Excluding the original patients with rheumatic infection, 7.5 per cent of the individuals in their families showed evidence of rheumatic disease, whilst only 3.7 per cent of the members in the families of the second group were afflicted, an incidence of 50 per cent less.

On adding together all the series mentioned in the literature, including the present one, the same noticeable frequency of rheumatic affections is found in families with original cases of rheumatic fever as compared with families with no original cases. The total number of rheumatic families thus collected is 1031: of these there were 46 per cent with one or more additional cases. On the other hand, 677 families with no original cases, showed only a percentage of 19.4 per cent with rheumatic disease.

The criticism may be made that insufficient physical examinations were made in the families of the second class, but even so the figures are highly suggestive of the direct communicability of the disease. H. E. MACDERMOT

**A Case of Sporotrichosis Meningitis.** Hyslop, Neal, Kraus, and Hillman, *Am. J. M. Sc.*, 1926, clxxii, 726.

These authors report what they regard as the first case of involvement of the central nervous system by a sporotrichial organism. The patient was a girl, aged fifteen years, who developed the cardinal features of meningitis, including optic neuritis and strabismus. The temperature subsided after three to four days. Later, there developed a left-sided partial ptosis, tinnitus of the left ear, and an exudate into the left retina. The blood examination showed 21,000 white cells per c.mm., of which the polymorphonuclears comprised 82 per cent. On lumbar puncture, the fluid obtained was usually blood-tinged: globulin and albumin 2 +: sugar, 68 mg. per 100 c.c.m. The contained cells amounted to 20 to 30 per c.mm. Wassermann and colloidal gold tests were negative. Abundant round and oval bodies were found in the cerebrospinal fluid, which were identified as spores of sporotrichia. Bacterioid forms were also seen. Cultures failed to develop, and inoculation experiments were inconclusive. The authors, nevertheless, have no doubt as to the nature of the organism. Towards the end, an inflammatory mass developed on the temporal side of the left optic disc. The patient died twenty-three weeks after being attacked. Autopsy showed a chronic diffuse lepto-meningitis, with gelatinous exudate, and œdema of the cerebral cortex. The lesion was chiefly confined to the base of the brain. No granuloma or abscess was present. The fluid in the ventricles was slightly increased. A. G. NICHOLLS

**On Symmetrical Thinness of the Parietal Bones.** Greig, D. M., *Edinb. M. J.*, Nov., 1926, xxxiii, 645.

In a masterly and beautifully illustrated paper Greig describes several specimens of symmetri-

cal thinness of the parietal bones and discusses the literature of the subject with particular reference to etiology. It is not common, but a considerable number of cases are now on record. Greig considers it to be a non-development of the diploë in the affected area, congenital in nature, inasmuch as it is an inherent developmental effect, but not manifesting itself until after infancy. He considers observations upon the condition in living persons untrustworthy, whether made by ordinary clinical methods or by radiography. It is of interest mainly as an example of a congenital condition which, however, does not manifest itself in early life, *i.e.*, until the time when the diploë should normally develop. I. M. THOMPSON

## SURGERY

**Tuberculosis of the Mammary Gland.** Fox, Ben, and Roblee, M. A., *Anns. of Surg.*, Nov., 1926.

Tuberculosis of the breast is of infrequent occurrence when compared with the frequency of tuberculous lesions elsewhere. Statistics show the frequency varying from 0.83 per cent to 1.4 per cent of surgical breast lesions. The authors report in full six cases from the files of the Barnes Hospital at St. Louis. They also give an analysis of thirty-nine cases reported between 1914 and 1924. The following are the different types of lesion:

1. Acute miliary tuberculous mastitis, which is always a part of the generalized infection. It is of little surgical importance.

2. Nodular tuberculous mastitis gives a breast with discrete nodules due to the bacilli lodging in the stroma of the gland. The nodules are irregular in contour and may fluctuate. They are tender. Nipple retraction occurs quite commonly. The skin eventually becomes involved.

3. Disseminated nodular tuberculous mastitis is a spreading variety of the former and is seen most commonly in the lactating breast.

4. Sclerosing tuberculous mastitis has a maximum of connective tissue.

5. Mastitis tuberculosa obliterans has the lesion chiefly surrounding the milk ducts, destroying the epithelial lining and filling the duct with debris.

Tuberculosis of the breast is one of the most benign forms of tuberculous infection. Surgical removal gives an excellent prognosis if operation is undertaken before the regional lymph glands break down. The prognosis of secondary involvement is good for the local lesion, the ultimate prognosis depending on the site of the primary focus. R. V. B. SHIER

**The Treatment of Peptic Ulcer from the Surgical Point of View.** Woolsey, G., *Ann. of Surg.*, Nov., 1926.

*Duodenal Ulcer.*—Medical treatment should first be tried and repeated for one or more times unless the patient is having hæmorrhage or cannot carry out a careful dietetic regime. The reported results of medical treatment are, however, misleading and do not give late results. Furthermore, relief of symptoms does not mean a healed ulcer.

When medical treatment has failed gastro-enterostomy is the operation most employed. Duodenal ulcers may be divided into certain groups:

1. Small single ulcers on the anterior wall not involving the pylorus or producing constriction. These are treated by excision with or without gastro-enterostomy, or by pyloroplasty with excision.

2. Chronic indurated ulcers without obstruction or hæmorrhage. For these gastro-enterostomy is the operation of choice.

3. Those producing pyloric stenosis. These require preoperative treatment to restore body fluids, and gastro-enterostomy gives excellent results.

4. Bleeding ulcers, comprising 14 per cent of all ulcers. In severe hæmorrhage absolute rest and transfusion are indicated. Surgery is indicated only for persistent bleeding or after its arrest to prevent its recurrence. At operation the ulcer should be excised if possible, but Balfour states that 87 per cent of bleeding ulcers are cured of the bleeding after gastro-enterostomy alone. Hæmorrhage from the anastomosis line is the surgeon's responsibility.

The weight of evidence is in favour of gastro-enterostomy with or without excision rather than pyloroplasty with excision. In all cases foci of infection must be adequately dealt with. Failure to cure ulcer by any method of operation is due "to failure to reduce acidity, to maintain this reduction, and to provide adequate drainage." (Balfour).

*Jejunal ulcers* are largely prevented by using absorbable sutures and adequately dealing with foci of infection.

*Gastric ulcers.*—Here the problem is different. Hyperacidity is not prominent, hypoacidity is common, and the question of malignancy enters. The latter occurs in association in two forms: (1) in large ulcers beginning to show malignancy, (2) in cancers which have ulcerated. The percentage of occurrence of cancer with ulcer varies widely in the statistics. The impossibility of determining the malignant change before or at the operating table makes their wide removal imperative. The clinical diagnosis is uncertain, the only certain methods of diagnosis being that of the radiologist and surgeon.

There are several methods of surgical removal: Excision by knife or cautery, Billroth I and II, mesogastric resection, and Polya resection. The Polya resection gives excellent results and a low mortality. R. V. B. SHIER

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## ANÆSTHESIA

**500 Rachianestesie Con la Tutocaina. (500 Operations Under Spinal Anæsthesia With Tutocaine;** from Professor R. Alessandri's Clinic, Rome). Valdoni, P., *Il Policlinico, Sezione Practica,* 1926, xxxiii, 1456.

Tutocaine is as effectual as novocaine and only a quarter as toxic. Alessandri uses a 2 per cent solution in physiological saline. He gives from two to four centigrammes, according to the depth and duration of anæsthesia required. In operations on the stomach the puncture is made between the twelfth dorsal and first lumbar; for the resection of the colon, between the first and second dorsal; for hernia and appendicitis, between the second and third, and for operations on the legs, between the third and fourth.

Half an hour before, or at the time of operation, 1 centigramme of caffeine is injected hypodermically. On the rare occasions when vomiting occurs during anæsthesia a second dose of caffeine is given. Headache occurs afterwards in 30 per cent of cases, sometimes it lasts six or seven days. Transitory diplopia, due to paralysis of the external rectus of one side, occurred in three cases. W. B. HOWELL

## PÆDIATRICS

**Narcolepsy—A Symptom Complex. Report of a Case in a Child.** Weech , A. A., *Am. J. Dis. Child.,* Nov., 1926, xxxii, 671.

There are two symptoms that characterize narcolepsy, (1) the patient has a tendency to go to sleep at frequent intervals through the day, the attacks of drowsiness often coming on at most inopportune times, (2) the patient may find that any emotion causes a feeling of generalized weakness, so that his knees may give way under him and allow him to fall. The sleep of a narcoleptic attack resembles normal sleep in all respects, and there is no relation between the number of attacks during the day and the amount of sleep which the patient gets at night. The attacks are quite different from epilepsy in that none of the frequently associated symptoms are present; the patient is able to fight off the attack for a time, even though he subsequently succumbs; he can usually be aroused without difficulty, and when the attack is over he is fully aware of having fallen asleep. The emotional attacks of weakness are brought on most frequently by laughter, but may follow any emotional disturbance. Narcolepsy has generally been considered a disease occurring about the time of puberty, or during adult life. The author reports two cases occurring in children. The first occurred in a girl of seven years, was associated with a lowered basal metabolic rate, and responded to treatment with thyroid extract, disappearing when the basal rate was brought to normal. The second occurred in a coloured boy of eleven years, who showed some improvement when given more opportunity for regular sleep during the day, but did not respond perceptibly to treatment by thyroid extract.

Narcolepsy typically runs a chronic course, is not associated with impaired mentality, and is apparently more common in males. During the last few years a number of cases have been reported in which the sleep disturbance has followed closely after epidemic encephalitis. However, up to the present time, there is no accurate knowledge concerning the etiology of this affection. None of the remedies advocated for narcolepsy have found universal favour. In reviewing the etiologic factors, and especially the known fact that the condition occasionally follows encephalitis, the author concludes that narcolepsy probably does not present a disease *sui generis* but is rather a syndrome or symptom complex, depending on injury of a definite area in the brain. R. R. STRUTHERS

**Dyspepsia in the Breast-fed Infant.** Harrell, T. H. and Boyd, E., *J. Ind. State Med. Ass.,* Oct., 1926.

Dyspepsia in the breast-fed infant is nearly always due to over-feeding, but occasionally it is caused by under feeding. Breast milk with its high percentage of lactose and fat and its low percentage of protein and calcium is conducive to fermentation in the lower intestinal tract. This leads to loose green movements, containing curds. The stools are very acid and irritate the buttocks. Much gas is expelled from the bowel. The infant suffers from discomfort or colic and is restless, irritable and always crying. He loses weight and may become dehydrated.

A similar clinical picture may be produced by underfeeding, when as a result of starvation the blood sugar falls below a certain level, hunger pains set in, and waves of peristalsis travel down the intestinal tract. These lead to discomfort, pain and loose stools.

Chemical analysis of the milk rarely show any abnormality. Only by weighing the infant before and after each nursing for a day or two can the cause of the dyspepsia be ascertained. In treating the cases due to overfeeding the first essential is to lengthen the intervals between feedings to four hours and in order to overcome the tendency to fermentation an ounce or two of a solution of protein milk powder or calcium caseinate should be given before each nursing. The same treatment will often succeed in the cases due to underfeeding —except that the addition of dextri-maltose is required to increase the caloric value of the food.

If these simple measures be tried it will rarely be found necessary to wean the baby entirely from the breast. L. M. LINDSAY

**The Development of Speech in the Normal Child.** Yearsly, M., *Brit. J. Child's. Dis.*, Jan.-Mar., 1926, xxiii, 1.

There are very few recorded observations on the development of speech in normal children. A proper knowledge should be had of normal development in order that we may be in a position to deal with abnormal cases. The present paper is based on the careful observations made by the author and his wife, of their own son during the first three years of life. These observations are compared with a similar series of observations published by Preyer in 1890, and by Darwin in 1877.

The first year of life is spent in methods of communication which are part animal, part primitive human, that is, by crying, laughing, frowning, grunting, etc., these methods serving as a scaffolding beneath which the main building of articulate speech is being built up. The second year is devoted to the compilation of a vocabulary and experiments therewith, the third year being occupied in perfecting and correcting. The years of speech development are an epitome of the evolution of language.

It is pointed out that, certainly after the first year, "baby talk" should not be encouraged and every assistance should be given to the child to increase and perfect its vocabulary; for this reason the child should be kept in the best possible environment and not be left too much in the company of illiterate servants. The author's child developed very much more rapidly than did the child of Preyer and it is suggested that possibly our methods of caring for children have very much improved since 1890.

The acquiring of the different letters and words is discussed, and a probable explanation is given for many of the difficulties experienced by the child in pronouncing certain vowels and consonants. A final appeal is made for the more general and detailed observation by parents of speech development, which should be carefully recorded and published. W. J. MCNALLY

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**Thyroid Hypertrophy and Pregnancy.**—Approximately 41 per cent of the last 520 women examined by Carl Henry Davis, Milwaukee, in early pregnancy had visible hypertrophy of the thyroid. Eight of these patients have returned with typical symptoms of toxic goitre within fourteen months after delivery. Small doses of iodine have been administered during pregnancy but none after delivery. No patient has returned with hyperthyroidism earlier than four months after delivery. Overwork, worry and other forms of nervous strain appear as contributing causes in each case. The use of iodine during pregnancy by women who live in goitre districts is advocated as a prophylactic measure, unless they have adenoma of the thyroid. Iodine hyperthyroidism is recognized as a possibility, but thus far has not been observed. The average metabolic rate of nine women with normal thyroids at term was + 2.4 per cent. Their average after delivery was - 1.3 per cent. The average rate of seven women with simple hypertrophy was +22.1 per cent before term, with a later drop to + 3.1 per cent. The average rate of nine women believed to be of the hyperthyroid type was + 32.2 per cent before delivery, with a drop eleven days post partum to + 8.9 per cent. With the exception of two patients in the last group, these patients took small doses of iodine during the last months of pregnancy. Patients previously operated on for toxic goitre are usually benefited by taking small doses of iodine during pregnancy. One such patient in the small group under observation apparently could not tolerate iodine. One patient had a successful operation for toxic adenoma of the thyroid in the fourth month of pregnancy and later took iodine. One patient with a history of toxic adenoma took iodine during pregnancy with apparent benefit, although she had a metabolic rate of + 86 at term. She was successfully operated on twenty days post partum. The baby was continued at the breast, and complementary feedings were stopped six days after the operation. The subsequent history of both mother and infant is very satisfactory. Prolonged nausea and vomiting in one case was evidently due to a crisis of exophthalmic goitre. The metabolic rates on this patient are given. She had a rate of + 81 per cent ten days before delivery. Her nausea was lessened by the use of iodine. Patients with toxæmia of pregnancy had low readings. Three with œdema and little or no albumin had lower readings than the single patient with high blood pressure, albumin and casts but no œdema. Comparative studies of the blood calcium and thyroid function, as indicated by the basal metabolic rate, show no relation between the milligrams of calcium in each hundred cubic centimetres of serum and the metabolic rate. Three patients with toxæmia of pregnancy showed a lowering of the calcium post partum, while the normal patients usually showed an apparent increase within eleven days. The use of cod liver oil and ultraviolet irradiation did not oppear to increase the blood calcium in the few cases studied.—*J. Am. M. Ass.*, Sept. 25, 1926.

XUM

# Obituaries

**Dr. William W. Hay** who had practised in Wallaceburg for over forty years, died there on December 16th.

**Dr. R. T. Wilson Herald,** a well-known physician in British Columbia died at Fernie, B.C., on January 1st following a brief illness from pneumonia. During the past few years Dr. Herald had maintained a practice in the Kootenay district of British Columbia specializing in ear, nose and throat work, and it was on one of his periodic visits to Fernie that he contracted his last illness. He formerly practised in Kelowna, but more recently his headquarters have been at Nelson. He was fifty-seven years of age and is survived by his wife, and one son. His brother, Dr. D. Herald, has for some years resided at Canoe River, Salmon Arm.

Dr. Herald was a graduate of Kingston University, where he obtained his degree as M.D., C.M., in 1890. Coming west in 1891, he practised in Vancouver for several years, later removing to 150-Mile House, Cariboo. Living in the centre of a cattle-raising country, Dr. Herald became interested in that industry, with the result that he retired from the medical profession for a number of years and purchased a large cattle ranch near Medicine Hat, Alberta. Returning to Vancouver shortly before the war, Dr. Herald resumed his practice. On the outbreak of the war, Dr. Herald and his eldest son enlisted in the 72nd Battalion Seaforth Highlanders. The son unfortunately was killed soon after his arrival at the front. Dr. Herald served with distinction and as medical officer of the battalion was awarded the Military Cross for conspicuous gallantry while attending the wounded during the battle of Vimy Ridge. He was invalided to England at the end of 1917, and on his return to Vancouver early in 1918 organized the first Vimy dinner on April 9, 1918, in commemoration of the battle. This event has been observed annually ever since. He also organized the Seaforth Association, composed of ex-members of the regiment.

**Dr. Adam Hilker** died in Hamilton on January 9th aged fifty-nine years. Dr. Hilker was a graduate of Queen's in 1889, taking later his degree of M.R.C.S. Edinburgh. During the war he saw service in England and France.

**Dr. Robert H. Preston** died in Brockville on December 21st in his eighty-seventh year. Graduating at Queen's in 1864 Dr. Preston had practised continuously at Newboro for sixty-two years; he had represented Leeds County in the Ontario House and had been also reeve and councillor of Newboro.

**Dr. George Pugh** died in Kenosha, Wisconsin, late in November.

**Dr. T. S. P. Strangeways.** The premature and sudden death of Dr. Strangeways, M.A., M.R.C.S., Lecturer on Special Pathology, Cambridge University, Examiner in Pathology and Director of the Cambridge Research Hospital, is a great loss to biology. His fourteen years of patient work on the cause and treatment of rheumatoid arthritis were, to the eye of an outsider, indeed fruitful, but can only be appraised by pathologists and physicians, as the future must determine the value of his pioneer work on cell division under x-rays. He was and will be known as the master of investigation in living cells.

He created, founded, and governed the Research Hospital, and the full extent of his unstinted generosity from his professional earnings can with difficulty be traced even in its books. He governed it alike when it was a hospital for the study of arthritis; when, through the munificence of Sir Otto Beit, it was an officers' hospital during the war, and in the last three years as a centre of research into the cells of living tissues growing outside the body, with especial reference to cancer and to the influence of x-rays. (From *The Weekly Times*, January 6th, 1927.)

**Dr. Donald Finlayson Walker,** died recently at his residence in Huntingdon, Quebec. The late doctor was a graduate of McGill University. Following his graduation from McGill he settled in Huntingdon where ever since he has practised. His death is the result of a recurrent illness of some standing.

# News Items

## ACKNOWLEDGEMENTS

We have received the *Bulletin of the Ophthalmological Society of Egypt* for 1926, and note with interest the steady efforts that are being made toward the control of diseases of the eye, and especially trachoma in Egypt. There has been an increase in the number of ophthalmic hospitals until there are now twenty-one permanent and eight travelling establishments, and the large numbers of patients treated at these is a striking illustration of the prevalence of diseases of the eye in Egypt. At the same time the yearly percentage of blindness amongst these patients shows an encouraging decrease from 15.3 per cent in 1919 to 10.4 per cent in 1925. The bulletin includes a series of papers dealing with ophthalmological subjects including one on the early period of Arabic medical and ophthalmological science.

We note, in the January number of the *Vancouver Medical Association Bulletin*, the adition of a section dealing with laboratory work. This material is to be supplied monthly by the joint activities of the various laboratories of British Columbia, and should furnish valuable information to those who are not in close touch with the larger laboratories.

## GREAT BRITAIN

Sir Gilbert Wills, a Governor of Guy's Hospital has increased a former subscription of £5,000 to the Bicentenary Fund of this institution to £50,000. This magnificent gift is for the specific purpose of extending the accommodation and completely remodelling, in accordance with present-day requirements, the out-

patients' and casualty department, where some 125,000 new cases are examined and treated every year.

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The Middlesex Hospital has been planning, and has already initiated a great reconstruction movement. To date the large sum of £335,000 has been contributed, which is very gratifying, but this amount is very far short of what will be required. During 1926 the Annex in Cleveland Street has been rebuilt without restricting the work of the hospital for a single day. It is proposed to reconstruct several of the old wards which constitute the well-known front of the institution, to provide a new out-patient department and a nurses' home, to build wards for private patients, and to erect an institute of biochemistry. In these extensive changes the existing important auxiliaries—the Medical School, the Cancer Charity, and Bland-Sutton Institute of Pathology, and the Convalescent Home will not be affected.

A. G. NICHOLLS

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### DR. ESSEX WYNTER'S GIFT

A great and discriminating piece of generosity was recorded last week, when, at a meeting of the governors of Middlesex Hospital, it was announced that Dr. Essex Wynter had given to the hospital his beautiful private house, Bartholomew Manor, Newbury, together with a large group of sixteenth century cottages and the surrounding land. Major Astor, in making to the court of governors an official declaration of the gift, added that Dr. Essex Wynter not only proposed to dedicate, after the death of himself and his wife, his fourteenth century home and its dependencies of nearly an equal antiquity to be held in perpetuity as a home for retired members of the nursing staff of the Middlesex, but with extraordinary open-handedness was providing an endowment fund for the maintenance and upkeep of the property. A side of Dr. Wynter's gift which marks its deeply personal character is that he is presenting to the institution, with which he has been so long and honourably associated, a property over which he and his wife have watched with loving care. Through their personal skill and work, the old manor house and the cottages on the estate have been intelligently repaired, while the surrounding land has been repurchased, securing a suitable and unspoilt environment for the buildings. Already two of the cottages have been reconstructed to form self-contained homes, which are now occupied by nurses, giving a practical example of what this fine gift to the hospital will eventually imply. The son of a great London medical school has in this beautiful gift recognized in a practical yet moving way indebtedness to his home of learning and the theatre of his life-work. (*Lancet*, Dec. 18, 1926, p. 1277.)

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From the President's address at the winter session of the General Medical Council we clip the following remarks which have an interest for the profession in Canada.

*New Brunswick*

"The Lord President was pleased to bring before His Majesty in Council the representations of the Executive Committee regarding a recent change of the law in New Brunswick, to which I made reference in June. These representations have been judged to be well-founded, and accordingly an Order in Council, dated Nov. 5th, 1926, has been issued, declaring that New Brunswick no longer affords to the registered medical practitioners of the United Kingdom such privileges of practising in the province as to His Majesty seem just. The Order of Oct. 4th, 1913, by which reciprocity with New Brunswick was established, is therefore revoked, and medical diplomas and degrees hereafter granted in the province will not be registrable in the Colonial List.

*The British Pharmacopœia.*

"The Lord President has further acceded to the request of the Council, formulated on June 4th, 1926, and has taken steps for the appointment of a small committee, on which the Council is represented, with power to make inquiries, to collect information, to receive evidence, and to make recommendations on the question whether it is desirable to make any, and if so what, alterations in the existing law or practice relating to the preparation or publication of the British Pharmacopœia and to its adaptation to the requirements of the British Empire. I have grounds for stating that this committee is at present engaged in making inquiries and collecting information bearing on the subject of its reference. (The *Lancet*, Nov. 27, 1926.)

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### THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

The annual meeting of the Royal College of Physicians of Edinburgh was held on December 2, 1926. Dr. George M. Robertson was re-elected President for the ensuing year; Sir Robert Philip was nominated Vice-President; Drs. G. Lovell Gulland, R. A. Fleming, Robert Thin, John Orr and Edwin Matthew were re-elected to form the Council.

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## GENERAL

### PROFESSOR EBERTH

The death in Berlin of Professor Eberth, the discoverer of the typhoid bacillus, in his ninety-fifth year, removes one of those great figures whose names have become "foundation-stones" of the science of bacteriology. His discovery will always rank as a great event in the history of medicine and was the beginning of the mass attack on this disease which has now reduced it, in this country at any rate, almost to vanishing point. The anti-typhoid inoculation practised so successfully during the war was an indirect outcome of Eberth's work.

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*International medical courses for post-graduate studies* will be held at Berlin in the months of March and April, 1927. They will be arranged by combined efforts of the faculty of medicine of the University of Berlin, the organization of the Kaiserin Friedrich-Haus and the association of university-lecturers for medical vacation-lecturers at Berlin. (1) Course of general survey on "Progress of medicine." (2) Course of special survey on the range "Diseases of the heart, the kidney and the vessels." (3) Course of survey on the domain "Scientific knowledge about rays." (4) Single courses on special subjects in all branches of medicine, some lasting a fortnight, and some lasting four weeks. These courses are combined with practical laboratory work and demonstrations of patients. Besides these courses there will be opportunity for clinical and laboratory work in the interneships of the important hospitals of Berlin, also for pathological

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anatomical work. This work will be arranged for according to individual wishes by the undersigned office.

Further information may be obtained from
Kaiserin Friedrich-Haus,
Berlin NW 6, Luisenplatz 2-4

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The Sofie A. Nordoff-Jung Prize for the best contribution in cancer research during the past year has been awarded to Dr. Otto Warburg, Director of the Department of Biology of the Kaiser Wilhelm Institute, Berlin-Dahlem. The award was made on the unanimous decision of the commission.

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The Italian government has granted 20,000,000 lire to the University of Rome for repairs and new construction work. The plans contemplate the creation of a university city comprising three groups of edifices, one devoted to medical study, the second to scientific and the third to include the faculties of law, letters and political science. A residential hall for 800 students and a large athletic field also will be built.

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PRESENTED WITH OWN PORTRAIT

Major-General J. T. Fotheringham, of the staff of Toronto University, former director-general of the Canadian Army Medical Corps, was honored by representatives of the Canadian medical profession and a number of well-known Canadian citizens when, in Convocation Hall on January 3rd, he was presented with a portrait of himself in uniform. Upon receiving the portrait, General Fotheringham presented it to the University of Toronto.

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## NOVA SCOTIA

CANADIAN MEDICAL ASSOCIATION LECTURES IN NOVA SCOTIA

A series of meetings under the scheme of the Canadian Medical Association for extra-mural postgraduate instruction was commenced at Yarmouth on November 29th and concluded at New Glasgow on December 3rd. Bridgewater, Truro and Sydney were the other towns visited. The lecturers, Dr. A. H. Gordon, of Montreal, and Dr. J. G. MacDougall, of Halifax, were accompanied by Dr. Smith L. Walker, associate secretary of the Medical Society of Nova Scotia. At each place visited, members of the local branch of the society attended in goodly numbers, and everywhere there was unanimous expression of appreciation of the work of the lecturers.

At Yarmouth there were two sessions of the Western Nova Scotia Branch. In addition to addresses by Doctors Gordon and MacDougall there were papers by Doctors G. W. T. Farish, L. M. Morton and C. C. Webster, and Dr. Walker spoke on "Membership in medical societies," urging all physicians to join the Canadian Medical Association. Dr. Gordon's address dealt with cerebro-spinal meningitis which he discussed fully and in a most interesting and instructive manner. He cited one case in illustration of the difficulty sometimes met in diagnosing this condition. After having been successively regarded as scarlet fever, smallpox, typhoid fever and tuberculous meningitis, spinal puncture finally disclosed the disease to be cerebro-spinal fever which responded well to serum treatment. Dr. MacDougall dealt with empyema, more especially from the standpoint of the surgeon. Special emphasis was laid on the dangers of operative interference before there has been fixation of the mediastinum. The interlobar empyema were fully and clearly described.

A resolution was passed protesting against the sale of iodized salt in the grocery shops of the province.

At Bridgewater, before the Lunenburg-Queens branch, at Truro (Colchester-Hants branch), at Sydney, (Cape Breton branch) and at New Glasgow (Pictou County branch), Doctors Gordon, MacDougall and Walker discussed the same subjects at as Yarmouth—except that at Sydney Dr. Walker broke other ground. At all these place, however, Doctors Gordon and MacDougall each gave a second address—the former speaking on sub-diaphragmatic abscess, the latter on goitre. Dr. Gordon dealt exhaustively and in a delightfully entertaining way with the diagnosis of sub-diaphragmatic abscess, and pointed out the effect of the folds of the peritoneum in localizing the condition in relation to the liver. Dr. MacDougall's discourse on goitre was most enlightening and enjoyable. After a brief but comprehensive reference to classification he discussed the chemical and physiological effects and clinical course of each form, and then proceeded to describe the surgical treatment.

At Truro, after his address on empyema, Dr. MacDougall responded to a request to speak on thoracoplasty, and dealt with the indications for the operation, the contra-indications, and his experience in results. At New Glasgow, following Dr. Gordon's address on sub-diaphragmatic abscess, Dr. MacDougall discussed the surgical aspects, his remarks being complementary to those of Dr. Gordon.

At Sydney the evening session was followed by a banquet, at which Dr. Gordon responded to a toast to the Canadian Medical Association. Dr. Walker proposed a toast to public health, to which Dr. John K. McLeod responded, and Dr. MacDougall toasted the Medical Society of Nova Scotia, with Dr. Roy, the president, as respondent.

SMITH L. WALKER

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Doctors J. G. D. Campbell, Gerald W. Grant, E. Kirk Maclellan and Gordon Wiswell have been appointed physicians to the Halifax Visiting Dispensary for the year 1927.

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In Public Health Notes for December, 1926, the Provincial Health Officer states that, according to the 1921 census, 2.8 per cent of the population of Nova Scotia is comprised of persons above the age of seventy-five. New Brunswick comes next with 2.1 per cent, while Alberta, at the foot of the list, can claim only that 0.50 per cent of its population has reached such an age.

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The Provincial Department of Health has two units, each composed of a physician and a nurse, engaged in conducting tuberculosis clinics in the province, and in making arrangements preliminary to a tuberculosis survey which is soon to be undertaken in the section which presents the nearest approach to an average and may thus be regarded as representative of the whole province.

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According to a report of the Provincial Health Officer, there were 997 births and 451 deaths in Nova Scotia during the month of August. The infant mortality rate was 64.19, an increase of 13.11 over the rate of the preceding August. There was a considerable increase in the number of deaths from

pneumonia and pulmonary tuberculosis, as compared with the preceding August, but in respect of deaths from other communicable diseases the comparison was favourable.

Dr. Seymour MacKenzie, who was elected Mayor of Westville early in 1926, has resigned that post, having found it impossible to give adequate attention to both his medical practice and the duties of the mayor's office.

A matter which is not without interest to physicians is the recent action taken by the Children's Aid Society in the case of a child suffering from a tuberculous hip. The child's parents are dead, and it is being given a home by its great grandparents. The kindly old folk removed the child from hospital against medical advice, and refused to carry out the instructions of the doctors. On learning that the child's future was being prejudiced the Children's Aid Society had the grandfather summoned to appear before the court, as failure to provide treatment of such a condition was found to be an indictable offence. The grandfather did not obey the summons, and was arrested. After a night in gaol he was interviewed by the superintendent of the Children's Aid Societies of the province. The night's experience had made him submissive, and he agreed to permit of arrangements being made for suitable medical attention to the child. Action was therefore suspended.

The Provincial Department of Health has asked that physicians report instances in which harm appears to have followed the ingestion of iodine, whether administered intentionally or unwittingly through use of iodized table salt. Simple goitre is not prevalent in Nova Scotia, and is limited rather sharply to districts in which there are deposits of lime. Exophthalmic goitre, on the other hand, is not uncommon, and may be prejudicially influenced by the use of iodine. As so many authorities insist that other factors besides deficiency in iodine are concerned in the causation of simple goitre, the Department advises against the general use of iodine which has been urged in districts where this condition is common. In this connection it is interesting to note that the Western Counties Branch of the Medical Society of Nova Scotia has passed a resolution protesting against the sale of iodized table salt in grocery shops.

W. H. HATTIE

## NEW BRUNSWICK

Dr. M. A. Oulton, M.L.A. of Shediac, is slowly recovering from a very serious illness. Dr. Ferguson of Moncton who has been attending him, reports that the doctor will soon be able to resume his practice and public duties.

On December 29th, commissioners of the General Public Hospital, St. John, entertained the medical staff of the hospital at dinner in the hospital. This is an innovation in the St. John Hospital and was suggested by Commissioner J. King Kelley. Views on hospital administration were exchanged by commissioners and staff, and suggestions for improvements of services were offered and accepted. It is felt that such functions are in the best interest of the hospital, because there is a tendency of the governing body and the administrative medical staff to maintain different viewpoints on important subjects of hospital policy, which can only be prevented by the closest co-operation.

The Provincial Department of Health of New Brunswick reports that scarlet fever is still prevalent in many parts of the province. The present epidemic has lasted for about three months and is only now beginning to show evidence of being controlled.

The sporting side of country practice was brought to our attention recently by a newspaper item in which it was reported that Dr. W. W. Jenkins of Gagetown had travelled from Gagetown to Oak Point on the St. John River by car. Any one who has driven an auto on ice can appreciate that this trip by Dr. Jenkins was not without its thrills.

Dr. P. H. Laporte of Edmundston, sailed with his family on the Montclare from St. John, December 31st, to Europe. He will spend several months in the clinics of Paris and Vienna.

Dr. H. I. Taylor, Minister of Health for the Province of New Brunswick, has returned home well on the road to good health. Dr. Taylor was operated upon last month for a serious abdominal condition and his many friends will be delighted to meet him again in his department at Fredericton and his practice at St. George.

Dr. L. DeV. Chipman has returned after spending some time in post-graduate work in Montreal.

Dr. W. D. Rankine of Woodstock, addressed the medical staff of the Victoria Public Hospital at Fredericton on January 11th. The subject of his paper was "Uterine hæmorrhage." Dr. Rankine's address was much appreciated.

A tuberculosis clinic is being organized in Fredericton. This clinic will be similar to those in operation at St. John and Moncton. The organization work is being carried out by Dr. G. C. MacLean, who has recently been appointed as travelling diagnostician in tuberculosis by the Provincial Government. A. STANLEY KIRKLAND

## QUEBEC

### MONTREAL

*Dr. Masson takes pathology chair.*—The University of Montreal and Notre Dame Hospital will gain the services of a pathologist by the appointment of Dr. Pierre Masson, of the University of Strasbourg, Alsace-Lorraine, as professor of pathology to the university, and pathologist to Notre Dame Hospital. Dr. Masson was for many years at the Pasteur Institute and was latterly professor of pathology at the University of Strasbourg. A further notable change in connection with the University of Montreal is the full-time appointment of Dr. Parizeau, as vice-dean and director of studies in the medical faculty at the university. Dr. Parizeau is now professor of surgery at the university and surgeon to Notre Dame Hospital. His new appointment will make necessary the giving up of this present practice, and he will

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accordingly resign his position as surgeon to Notre Dame Hospital, becoming instead honorary surgeon. It is not yet known whether or not he will retain the professorship of surgery at the university. Dr. Parizeau is a native of Montreal and a graduate of St. Mary's College. He received his medical education in Paris. GEORGE HALL

QUEBEC CITY

At the last meeting of the Quebec Medical Society, Dr. J. Vaillancourt, professor at Laval was elected president for the year 1927. Dr. Guerard also professor at Laval and Dr. W. Verge are now vice-presidents. Other officers were re-elected.

The new hospital "l'Hôtel-Dieu du Saint-Sacrement" which is now being erected in Quebec as one of the most modern, with a capacity of four hundred beds, will be opened next fall, probably in October. This hospital will be under the control of the medical faculty, as well as the Hôtel-Dieu du Precieux-Sang, the St-Michel Archange Asylum together with the Clinic Roy-Rousseau, the Laval Hospital for tuberculosis, the "Crèche St-Vincent de Paul" for infants, the Maternity, and the Civic Hospital for Contagious Diseases. A medical board under the supervision of the dean of the faculty has already been organized in four of these hospitals.

Professor Rousseau, Dean of the medical faculty who represented the Dominion at the Laennec Centenary in Paris, gave a clinical lecture at the Hôpital de la Charité, at which Professor Roger, Dean of the Paris Medical Faculty presided. Professor Rousseau sailed for Canada on January 19th.

Doctor J. B. Lacroix, professor of physiology at Laval was elected secretary and representative for Canada of the Association of French Physiologists. Three countries besides France will now be represented in this association: Belgium, Switzerland and the Dominion of Canada. A. VALLEE

## ONTARIO

Dr. Frederick R. Miller of the University of Western Ontario Medical School lectured on Dec. 28, 1926, before the Academy of Medicine of New York City and on January 4, 1927, before the Academy of Medicine of Buffalo; the subject of each lecture was "The physiology of the cerebellum."

At the clinical meeting of the Wellesley Hospital held on December 9th the following programme was presented: (1) "Lung mapping by bronchoscope with lipoidal; demonstration of the method on patients," by Dr. Halliday; (2) "Recent trauma of the eye," by Dr. C. Hill; (3) "Acute pancreatitis," by Dr. A. S. Moorhead.

The Harvey Club of London met on December 21st and were addressed by Dr. E. Spence on the subject of "Diabetic acidosis with remarks on treatment."

Contracts for the new Metropolitan Hospital at Walkerville have been let and construction will be proceeded with at once. This hospital will serve the border cities and will be under the management of the Essex Border Utilities Commission.

The St. Catharines General Hospital is planning the erection of a new wing at the cost of $170,000. The greater part of this sum has been secured by public subscription.

At the meeting of the Hamilton Medical Society on January 7th Dr. Giffen of the Mayo Clinic spoke to a large audience on the subjects "Diseases of the blood" and "Splenectomy."

Dr. Gwyn of Toronto addressed the Windsor Medical Society on January 4th taking as his subject "Diagnosis and treatment of pneumonia and empyema."

At a dinner given in his honour in Hart House on January 3rd. General John T. Fotheringham was presented with his portrait painted by W. J. L. Forster. General Fotheringham in turn presented the portrait to the University of Toronto to be hung in the medical building. The portrait is a tribute to Dr. Fotheringham from his old friends in the medical profession and the army, and the painting of it is in accordance with a bequest in the will of the late Dr. George Strathy; to this bequest has been added a sum of money contributed by many of General Fotheringham's associates and students; speakers at the banquet included Dr. Duncan Graham who presided, and who formally presented the portrait to General Fotheringham; Canon Cody who accepted the portrait on behalf of the university, Sir William Mulock, General Birkett, General Otter, Dr. J. A. Temple and Professor Maurice Hutton. N. B. GWYN

*Wellington and North Halton Medical Society.*—The annual meeting of the society was held in the Guelph General Hospital on Wednesday afternoon, December 8, 1926, thirty being present. Encouraging annual reports were presented and the following officers were elected: Honorary President, Dr. A. Groves, Fergus; Honorary President, Dr. H. B. Coleman, Palmerston; President, Dr. H. H. Argue, Mt. Forest; first Vice-President, Dr. Bennetto, Guelph; second Vice-President, Dr. Gowland, Milton; Councillors, Dr. Robertson, Elora, Dr. Kirby, Guelph, and Dr. Williams, Georgetown; Treasurer, Dr. A. B. McCarter, Guelph; Secretary, Dr. N. C. Wallace, Ontario Reformatory, Guelph.

An excellent programme was presented as follows: "Sutures of fascial tissues in hernia operations," Dr. A. Groves, Fergus. "Antitoxins, serums and vaccines," Dr. R. D. Defries, Toronto. "Fractures and their treatment," Dr. George Wilson, Toronto. Following the programme, the matron and nurses served high tea, which was much appreciated. NORMAN A. WALLACE

*York County Medical Society.*—The annual meeting of the society was held at the home of Dr. C. J. Devins, Aurora, on the afternoon of Thursday, December 16th. The following officers were elected for the year 1927. President, Dr. Walter Sangster, Stouffville; Vice-President, Dr. S. J. Boyd, Newmarket; Secretary, Dr. C. J. Devins, Aurora; Treasurer, Dr. Herbert Freel, Stouffville; Councillors, Dr. S. W. Otton, Newmarket, Dr. G. W. Williams, Aurora, Dr. Charles Johns, Thornhill. The meeting was well attended and an excellent paper was read by Dr. James C. McClelland of Toronto on "Obstructions of the genito-urinary tract." A good discussion followed the reading of this paper. S. W. OTTON

## MANITOBA

Dr. R. Blanchard, formerly of Souris, has opened an office at Norwood Court, 300 Tache Avenue, Norwood.

Dr. Carl Eaton, representative of the American College of Surgeons and connected with the 1927 Hospital Standardization Survey recently inspected Manitoba hospitals.

Dr. J. W. Good who died Sept. 1, 1926, left an estate of over half a million dollars according to a will left by him dated Aug. 9, 1918. Among the bequests were: Manitoba Tuberculosis Sanatorium, Ninette, $2,500.00. Children's Home, Winnipeg, $2,500.00. Old Folks Home, Middlechurch, Manitoba, $3,000.00. Mrs. Gordon Bell, Winnipeg, $3,000.00.

The recent visit to Winnipeg of Dr. L. G. Crandon of Boston accompanied by his wife Marjorie, the famous medium, created much interest and discussion among medical and other circles on the question of psychic research.

Dr. A. W. Allum of Winnipeg has recently returned from a post-graduate course of two years in Europe and the British Isles and has resumed practice.

Dr. and Mrs. N. H. Blakie have left Winnipeg to reside at Dominica, Leeward Islands, where Dr. Blakie has accepted an appointment.

Prof. Edwin O. Jordan, of the Department of Hygiene and Bacteriology, University of Chicago, has accepted an invitation to deliver the Gordon Bell Memorial Lecture before the Winnipeg Medical Society on April 22nd. His subject will be "Food poisoning."

Vol. 1, No. 1, of the *University of Manitoba Quarterly* appeared in December. It contains articles by President James A. MacLean, R. K. Finlayson, President of the Alumni Association, Prof. E. P. Fetherstonhaugh, Dean of Engineering, Miss Thelma LeCocq, and a charming poem by Horatio Wallace. The new publication is attractive both in its appearance and its contents and we wish it every success.

Dr. Gordon S. Fahrni, of Winnipeg, delivered an address "Unnecessary complications and their prevention in goitre surgery" on February 1st at the annual meeting of the American Association for the Study of Goitre at Philadelphia.

At the January meeting of the Osler Society, Dr. A. T. Mathers spoke on "The miracles of Canterbury" and Dr. M. Wintrobe on "The healing shrine of Ste. Anne de Beaupre." At the February meeting Dr. Ross Mitchell spoke on "William Hunter" illustrating his remarks with lantern slides of the engravings in *The Anatomy of the Gravid Uterus.*

The annual medical bonspiel for the Harvey Smith Tankard and Consolation Prize is being held at the Granite Rink, February 16th and 17th. ROSS MITCHELL

## SASKATCHEWAN

At the annual meeting of the Regina District Medical Society the following officers were elected: President, Dr. D. C. Hart, Regina; first Vice-President, Dr. Hart, Indian Head; second Vice-President, Dr. H. H. Mitchell, Regina; Secretary, Dr. R. McAllister, Regina; Treasurer, Dr. S. E. Moore, Regina. Executive: Dr. E. J. Ellis, Dr. H. L. Jackes, Dr. Beattie Martin, Dr. Lillian Chase, and Dr. M. A. Carmichael.

The last regular monthly meeting of the year was held in the Regina General Hospital and the two following cases were presented: "Tetanus," Dr. Corbett, and "Syphilis in the infant," Dr. Gareau. The cases were very interesting and were followed by considerable discussion.

The first monthly meeting of the new year was held on January 7th, taking the form of a dinner in the restaurant of the Parliament Buildings. Dr. D. S. Johnstone who has recently been enjoying himself on a hunting trip, in northern Saskatchewan supplied the moose which was used on this occasion. After the dinner addresses were given as follows: Dr. S. E. Moore, "Hospital standardization," Dr. J. B. Ritchie "Pelvic infections," and Dr. G. R. Peterson "Hernia." The papers brought out a great deal of interesting discussion. A hearty vote of thanks was tendered to the speakers of the evening.

The following doctors have commenced practice in this province recently: Dr. Joseph Hollenberg, Melville, Dr. Numi Hjalmarsson, Churchbridge, Dr. H. A. L. Portnuff, Yorkton, and Dr. O. L. Taylor, Mortlach.

At the annual meeting of the Saskatoon District Medical Society the following officers were elected: President, Dr. E. E. Shepley, first Vice-President, Dr. H. C. Boughton both of Saskatoon, second Vice-President, Dr. L. H. Johnston, Sovereign, Secretary, Dr. A. L. Anderson, Saskatoon. Executive: Dr. A. L. Lynch, F.R.C.S., Dr. L. H. McConnell, and Dr. J. P. DesRosiers, all of Saskatoon.

Dr. A. C. McKean, who has been practising for several years in this province is now located at Garwin, Iowa.

Dr. M. T. MacAvelia, formerly of Mileston, Dr. A. W. Knox, and Dr. C. G. Merrick formerly of Weyburn are now practising in Florida.

Dr. W. A. Magrath late of Wynyard, is at Los Angeles.

Dr. B. E. Knapp, formerly of Springwater, has moved to Islay, Alta.

Dr. A. E. Cantelon has moved his office from Piapot to Stoughton, Sask.

Dr. G. M. Robertson, who practised for several years at Stoughton, has joined the staff of the Weyburn Mental Hospital.

Dr. W. P. Ross formerly of Rhein has opened an office at Rapid City, Man.

Dr. R. McKinnon, of Margo has opened an office at Dundurn.

The annual meeting of the Council of the College of Physicians and Surgeons of Saskatchewan was held at Regina, January 5th. The present officers were re-elected and are as follows: President, Dr. E. L. King,

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Prince Albert, Vice-President, Dr. E. R. Myers, Saskatoon, and Registrar, Dr. A. MacG. Young, Saskatoon.

The next annual meeting of the Saskatchewan Medical Association will be held at Moose Jaw, Saskatchewan. Arrangements are now being worked out with the General Secretary of the Canadian Medical Association, Dr. T. C. Routley, to co-operate with the other western medical associations. It is hoped to have medical men address the association from England and the United States, as well as some of the ablest men in the profession in Canada. It is hoped that all medical men of this province will so make their engagements that they will be able to attend the annual meeting this year. No effort is being spared to make this meeting, not only valuable from a clinical standpoint, but also from a social standpoint. The date has not been definitely settled, but it is anticipated that it well be either late in August or early in September.

Dr. Bow who has been joint medical officer of health for the city and medical superintendent of the Regina General Hospital, has resigned from these appointments and been appointed Deputy Minister of Public Health in the Government of Alberta. Dr. Bow has proven a very capable and successful administrator and will be much missed in medical circles in Regina. He will carry with him the best wishes of all his confrères here.

Dr. Tucker of Francis spent some time recently in clinics in Chicago.

Dr. David Low, a past president of the Canadian Medical Association has accepted the post of medical superintendent of the Regina General Hospital. His duties will commence February 1, 1927.

Dr. J. O'Brien has moved from Bladworth where he has practised for the past nine years, to Dubuc, Sask.

Dr. A. N. Hardy and Dr. E. E. Kells of Regina have left for a prolonged course of study and post-graduate work in the clinics of Europe. They intend to spend most of their time in Vienna.

## ALBERTA

The annual report of the proceedings of the Council of the College of Physicians and Surgeons of Alberta has just been issued and reflects much credit on those who were responsible for its compilation. Many subjects not alone of local but of general interest to the profession are contained within the covers of this extensive report. We note *inter alia* some pertinent remarks concerning governmental interference in the affairs of our profession: "Threatened interference by unnecessary governmental action has had an unsettling influence on the profession. It seems difficult to understand the psychology of people in power unnecessarily interfering with the work of the profession which is at the beck and call of suffering humanity during twenty-four hours of the day and under all weather conditions, and which has rendered free medical service to the people of this province, which expressed in money, would represent a sum greater than the budget of the Provincial Department of Health."

In regard to British reciprocity "the Council is of the opinion that, British registration through reciprocity being made a means of transfer from one province to another, should cease, and that an amendment to the Act Respecting the Medical Profession, whereby Canadian registrants in the British Medical Register through reciprocity with some other province in Canada, should have a year's practice in Great Britain or do at least a year's post-graduate work there before applying to Alberta for our registration.

"The suggested amendment is as follows: 'No registrant of the General Medical Council of Great Britain shall be received and registered as a member of our college unless and until he has had twelve months' actual practice in Great Britain or who has spent in post-graduate work one full year and furnishes evidence to that effect to the satisfaction of the Registrar'."

Attention is called to the fact "that while the Medical Council of Canada has no reciprocity with the General Medical Council of Great Britain, yet that council will register any member of a provincial college (of physicians and surgeons) who presents his certificate from the Medical Council of Canada.

Dr. Gordon E. Thompson of Hardisty has been appointed surgeon for the Canadian Pacific Railway Company at this point.

Dr. G. H. L. Armstrong of Islay has sold his property to Dr. B. E. Knapp of Springwater, Saskatchewan. He will practise in eastern Canada in future.

Dr. Gordon Dowsley, a recent graduate of Toronto University, has accepted a position with Dr. A. G. Scott of Bassano.

Dr. R. J. Morrow is now practising at Picardville, Alberta. This is the first time that this town has had a resident physician.

Dr. A. K. McNeill, a recent graduate of Manitoba University, is now assistant to Dr. D. N. McCharles of Empress, Alberta.

We regret to record the death of Dr. A. E. Wickens of Sedgwick, which took place suddenly on December 2nd last. He graduated from Toronto University in 1900 and had practised in Ontario for some years before coming to Alberta. He was highly thought of in the district in which he practised.

Dr. W. J. McKenzie, for many years associated in practice with Dr. Parsons of Red Deer, has moved to the coast. His place has been taken by Dr. S. McGregor.

Dr. F. W. Stockton of Calgary, who has been seriously ill during the past few months, has returned from Rochester, Minnesota. His many friends hope for his recovery in the near future.

The only district in Alberta where it was necessary to hold an election for the Council of the College of Physicians and Surgeons was in Camrose. Dr. W. V. Lamb was elected by a substantial majority; there were four candidates.

The authorities of the Municipal Hospital of Onoway are looking for a new superintendent since Dr. H. B. Honey resigned from the position to take up practice elsewhere.

At the monthly meeting of the Calgary Medical Society held on January 4th, Professor E. L. Pope of Alberta University addressed the members on the subject of "Prognosis." This thoughtful lecture was greatly appreciated by all of those who were present.

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The Council of the College of Physicians and Surgeons has issued the annual report, which contains a portrait of Dr. R. G. Brett in black and white. This doubtless will be retained by many in memory of the man who did so much for our profession in western Canada.

At the December meeting of the Council of the College of Physicians and Surgeons two representatives each from the north and south of the province were appointed to confer with similar appointees from the Pharmaceutical Association on the subject of closer co-operation. These committees will sit in Edmonton and Calgary and review conditions and present reports which will be discussed in June next when the governing bodies of the physicians and druggists will probably hold a joint meeting.

Dr. G. M. Cody, a graduate of Toronto University, who has spent the past four years in post-graduate work in Toronto, Glasgow and London, in the study of the diseases of children, has settled in Calgary, where he will specialize in this branch of medicine.

G. E. LEARMONTH

## BRITISH COLUMBIA

The December general meeting of the Vancouver Medical Association was held on December 7th, when fifty-three members attended. Excellent papers were given by Dr. W. F. McKay on "Referred pain" and by Drs. W. S. Turnbull and J. W. Arbuckle on "Eclampsia." These papers will be published in the association's bulletin. The secretary announced that Drs. Fred. N. Robertson and William Morris had been appointed to the staff of the Vancouver General Hospital in medicine and tuberculosis respectively. Dr. Kenneth L. Craig was elected a member.

At the clinical meeting of the Vancouver Medical Association on December 21st, Dr. Frederick Brodie presented an interesting case of disseminated sclerosis and gave a very interesting résumé of the condition in general. A case of spontaneous pneumothorax complicating what appeared to be a typical pneumonia was presented by Dr. J. W. Ford, and a series of cases of back injury was presented by Drs. J. A. Gillespie, W. A. Gunn and W. C. Walsh.

The annual meeting of the North Pacific Surgical Association was held in December, 1926, in Vancouver under the presidency of Dr. H. R. Storrs, when Drs. A. W. Hunter, A. J. Maclachlan, W. B. Burnett and W. S. Turnbull of Vancouver were elected to membership. Dr. R. E. McKechnie gave a paper on the "Treatment of certain forms of spinal injury." Fifty members out of a possible sixty were present at the meeting.

The next meeting of the Fraser Valley Medical Society will be held on January 18th, when an address will be given by Dr. S. C. McEwen, of New Westminster, on "Genito-urinary troubles."

Dr. Geo. T. Wilson of New Westminster is now convalescent from a sharp attack of influenza.

The first issue of the *British Columbia Laboratory Bulletin* appears in the January number of the *Vancouver Medical Association Bulletin*. The material for this little publication is supplied by the joint activities of the various laboratories throughout the Province of British Columbia, and its publication has been made possible by the interest taken in it by the secretary of the Provincial Board of Health, Dr. H. E. Young. Miss D. E. Kerr, M.A., of the Vancouver General Hospital Laboratories is the editor.

The *Vancouver Medical Association Bulletin* for January reports with deep regret the passing away of its first president in the person of Dr. D. H. Wilson who died shortly before Christmas at the age of seventy-two.

The economic value of public health service, which, when expressed in terms of dollars and cents by actual calculation, amounts to millions of dollars annually, was emphasized by Dr. H. E. Young, Provincial Health Officer for British Columbia in an interesting address delivered on January 3rd, before the Vancouver Board of Trade Health Bureau. Dr. Young took for his theme "The potential value of a man."

Dr. J. S. Burris, of Kamloops, was a visitor to Vancouver early in January.

Dr. A. M. Menzies of Britannia Beach was taken sick in the latter part of December. His practice is being cared for by Dr. A. S. Underhill of the Vancouver General Hospital.

Dr. Thos. L. Buttars has relinquished his practice at Courtenay, Vancouver Island, and is now practising in West Point Grey, Vancouver. Dr. Josiah McKee, late of Stonewall, Manitoba, has taken over Dr. Buttars' practice at Courtenay.

Dr. P. J. Emerson of Nakusp, while on his way to see a country patient, sustained an accident which has necessitated his lying up for a few weeks.

A joint luncheon meeting of the British Columbia Medical and Vancouver Medical Associations will be held in the latter part of January, when an address on "Legal medical problems" has been promised by R. L. Calder, K.C., of Montreal.

## UNITED STATES

### PLANS FOR THE MEDICAL SCHOOL AT THE UNIVERSITY OF CHICAGO

In making the announcement of a gift of $3,385,000 from the General Education Board for the new medical school at the University of Chicago, President Max Mason called attention to the magnitude of the medical programme which the university is about to inaugurate with the opening of its beautiful Gothic medical buildings covering two square blocks on the Midway. The new medical school, one of the most modern and complete in America, will provide hospital

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and clinic, as well as facilities for medical study on a large scale in close proximity to the established scientific departments of the university.

The present gift, conditioned on the raising of $2,000,000 more for endowment, makes possible one of the most significant programmes of medical education and research ever attempted in the United States. This programme will be partially supported by assets brought up to $20,000,000 by the present gift. Perhaps the most striking feature of the whole programme is the establishment of clinical departments on the campus of the university which are to function in the graduate school of science. This makes the medical sciences a definite and integral part of the university, tying them up in a very effective way with the premedical sciences.

As an integral part of the medical programme will be conducted the work of the Douglas Smith Foundation for Medical Research, supported from the income of a $1,000,000 fund.

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Dr. Hedley Williamson, well known Detroit physician, died Friday morning at Harper Hospital following an operation, Nov. 26, 1926. Dr. Williamson had practised medicine in Detroit since 1892, following his graduation from McGill University and two years study in Europe.

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MEDICAL COLLEGE OF VIRGINIA

The executive committee of the board of visitors of the Medical College of Virginia, Richmond, has authorized President W. T. Sanger and the college authorities to map out a twenty-year building programme preliminary to the construction of three new buildings projected for the immediate future. These will include a women's dormitory, a new clinic for the walking sick, and laboratory for chemistry, bacteriology and pathology.

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At the memorial exercises held at the Medical College of Virginia, Richmond, on January 7, for Dr. John W. Brodnax, anatomist and artist who died last October, papers were read by Dr. W. Lowndes Peple, Dr. Robert C. Bryan, Dr. H. L. Osterud, Dean W. F. Rudd, and Mr. Rufus Alley. Doctor Brodnax was a member of the department of anatomy of the Medical College of Virginia for thirty-three years.

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# Book Reviews

**Human Pathology—A Text-Book.** Howard T. Karsner, M.D., Professor of Pathology, School of Medicine, Western Reserve University, Cleveland, Ohio. 980 pages: 463 illustrations, of which 20 are in colour. J. B. Lippincott Co., Philadelphia and London, 1926.

This work is the latest addition to a notable list of very excellent text-books on pathology that have appeared during the past two or three years. The author's purpose is indicated in the preface, where he says that it is "to present the morphological alterations incident to disease, in the light of modern views as to their functional significance." Starting from the facts of morbid anatomy and pathological histology he passes to the interpretation of these facts, distinguishing, as far as possible, between what is accepted and what is merely hypothetical, using the whole concept as a basis for a brief introduction to the clinic.

At the head of each chapter is a table which gives a skeleton plan of its content, facilitating the assimilation of the subject matter; and at the end a bibliography, which, while not pretending to be exhaustive, includes the most useful references.

Teachers will, of course, differ as to the best way to present to the student the essentials of pathology, a subject now grown so vast as to be unwieldy, and it takes much ability to know what to omit. Professor Karsner adheres to the time-honoured division of the subject into *general* and *systemic* pathology. His method of approach to the former may be judged from the headings of his chapters, which are: General Phenomena of Disease; Pathological Pigmentation; Degenerations and Infiltrations; Necrosis and Somatic Death; Mineral Infiltrates and Concrements; Atrophy; Disturbances of Circulation; Inflammation; Principles of Infectious Disease; The Infectious Granulomata; Progressive Tissue Changes; Tumours.

In the opinion of the present reviewer, there might be a better balance of the topics. Thus, the very important and fundamental subject of the Causation of Disease is dealt with in a scant ten pages, while the relatively trivial matter of the Pigmentations is accorded twenty-seven. The chapter on Inflammation leaves one with a somewhat confused impression, and the matter might be better arranged. The philosophical presentation of this cardinal topic by Adami, on the lines of comparative pathology, has so far not been equalled, and leaves one in a critical frame of mind in regard to the effort of subsequent writers. But, after all, these impressions detract very little from the merits of an otherwise splendid work. A very valuable feature of Professor Karsner's book is the way in which he interweaves the research work on any given topic, thus providing an historical continuity of ideas, and embellishing what might be, at times, to the average student, a somewhat gaunt and arid topic, with the interest that comes from the realization of successful effort and achievement. This, too, might well prove to be a stimulus to farther advancement.

The book is well produced, and the illustrations, many of them taken from Prof. Simon Flexner's collection, are clear and always elucidate the text. While containing an amazing amount of information, the book is not too unwieldy for students' use. It is easily the best of the recent contributions to the armamentarium of the teacher and student of pathology, and is unhesitatingly recommended. A. G. NICHOLLS

**A Practical Medical Dictionary.** Thomas Lathrop Stedman, A.M., M.D., Editor of the "Twentieth Century Practice of Medicine," and of the "Reference Handbook of the Medical Sciences," formerly editor of the "Medical Record." Price $7.50. Ninth, revised edition. 1147 pages with appendix. Illustrated. William Wood and Company, New York, 1926.

This dictionary which has been edited by a scholar, and has reached its ninth edition, calls for notice but only for a brief review. In the first edition the editor called attention to the many barbaric combinations in use in many new words; combinations which were painful to the ear and vexatious to the spirit of anyone with a sense of linguistic fitness. In each new edition he has emphasized the desirability of framing new medical terms on pure Greek or pure Latin form, and has so far as practicable thrown the weight of authority in this matter on the right side. In the present edition the derivation and pronunciation of all important words are carefully stated, and throughout the volume the addition of synonyms has added much to the value of the definitions. Several hundred

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new words have been introduced, and all the changes made in the new United States Pharmacopœia and in the National Formulary have been noted. An alphabetical table of all drugs and their indications has been added to the appendix. The illustrations are numerous. The types employed are pleasing to the eye. This volume has been lying on the editorial desk for some months and has been consulted almost daily in reference to the exact definition and to the orthography of words, and has in every case given satisfaction. The printer's and the binder's work has been done well. It can be recommended as a most useful addition to every medical library. A.D.B.

**Text-Book of Nervous Diseases.** Charles L. Dana, A.M., M.D., LL.D. Tenth edition. 667 pages, 262 illustrations, four plates in black and colour. Price $7.00. William Wood and Company, 51 Fifth Avenue, New York, 1925.

The tenth edition of Prof. Dana's well-known Text-Book of Nervous Diseases presents several additional features over previous editions. As a single volume text-book on nervous diseases, it has ranked among several of the best for many years, and the revised and augmented edition herein reviewed fully sustains this reputation.

One very pleasing contribution to the new edition is the chapter on the history of neurology by Dr. Fielding H. Garrison, who in some forty pages has outlined the important steps in the establishment and advancement of neurological medicine from Hippocrates to our own day. This chapter presents a vast amount of information in a most pleasing manner.

The chapter on Epidemic Encephalitis is entirely re-written and offers a concise but fairly complete résumé of the valuable literature on this disease. The chapter on Preventive Neurology is new and is to be commended. The illustrations are clear and well-selected, the tables not too cumbersome and the index ample. It is unfortunate that many typographical errors have crept into the text, but this does not detract from the comprehensive and well-balanced make-up of a volume which, of necessity, embodies an immense subject-matter in a small space.

As a text-book for the student and general practitioner, it is highly recommended. F. H. MACKAY

**A Guide to Anatomy.** E. D. Ewart. Second edition. 336 pages, 97 illustrations. Price 12/6 net. H. K. Lewis & Co., Ltd., London, W.C.1, 1926.

This book was written to serve as a handbook for students of massage and medical gymnastics. As a guide to anatomy, the author does not pretend that it is at all complete, as it deals in the main only with parts of the body concerned in massage treatment.

The book is well illustrated with figures—some in colours and diagrams and contains a very complete index. While the descriptions of anatomical structures are very brief, they are for the most part clear, simple and well arranged. The volume would probably serve a more useful purpose, if more consideration had been given to function.

Larger text-books, such as Gray and Cunningham, are hardly suitable for use by massage students or nurses—except for occasional reference. A smaller book such as the above is undoubtedly more serviceable. F. W. HARVEY

**The Ophthalmic Year Book, Volume XXII.** 315 pages, 1925. Edited by Wm. H. Crisp, M.D., D.Oph., F.A.C.S. The Ophthalmic Publishing Company, Chicago, 1926.

The present volume of the Ophthalmic Year Book contains a bibliography of the ophthalmic literature published during the year 1925. Following the bibliography of each chapter there is a digest of the more important papers. An authors' and subject index are to be found at the end of the book.

The Year Book is essentially one for ophthalmologists, and is of invaluable help to them in a search of the literature. The greatest praise is due the editor and his collaborators for the manner in which they have performed this arduous task.

The publication is a part of the *American Journal of Ophthalmology* and is issued to all its subscribers.

J. A. MACMILLAN

**Freshman Hygiene.** Raymond C. Bull, M.D., and Prof. Stanley Thomas. 288 pages, 74 illustrations. Price $2.25. J. B. Lippincott Co., 201 Unity Bldg., Montreal, 1926.

Apparently there cannot be such a thing as too much teaching of hygiene. The writers of this book have found that in spite of the courses given in preparatory schools, college students still show an ignorance of some of the most simple and important facts in hygiene. They have therefore picked out such points as experience has shown them to be most in need of reiteration, and have also added some chapters which are concerned with matters not generally included in courses of hygiene, *i.e.*, sex, venereal diseases and civic aspects of social hygiene. These are matters on which instruction is always difficult, but the writers have dealt clearly with them, and that is the first essential in any teaching.

The book should be welcomed by those interested in the welfare of their students. H. E. MACDERMOT

**Anatomy of the Wood Rat.** A. Brazier Howell, 255 pages, 37 figures. Price $5.00. William & Wilkins Co., Baltimore, 1926.

This is one of a series of monographs published by the American Society of Mammalogists. The need for such a work is considerable. As is well said in the foreword, the tendency has always been to describe the rarer species of animals rather than the commoner forms, such as the ordinary white rat. And yet this animal plays a large part in laboratory work, and from this point of view alone is deserving of a more detailed description of its anatomy.

It is from the standpoint of comparative anatomy, however, that the need for the work is greatest. Dr. Howell has proposed for himself a problem which is of great interest, namely, the convergence of mammals of diverse affinities towards types highly specialized for certain definite modes of life, and his book is a beginning in the solution of such a question.

We commend the book to all those interested in anatomical and developmental questions. The illustrations and printing are especially worthy of praise.

H. E. MACDERMOT

**The Harvey Lectures.** Delivered under the auspices of the Harvey Society of New York under the patronage of the New York Academy of Medicine, Series xx, 1924-25. Price $3.50. J. B. Lippincott Co., Montreal.

Amongst the number of interesting papers contained in this series we note especially "Studies on the normal and pathological histology of the lungs" by Dr. William Snow Miller of the University of Wisconsin. Dr. Miller has made this subject peculiarly his own for the past thirty-five years, and has contributed largely to a point in anatomy, which still requires much research. His plates and reconstructions are exceptionally clear.

In addition there are lectures by Dr. Hill on "The recovery process after exercise in man"; by Dr. Dochez on the "Etiology of scarlet fever"; by Dr. Schloss on "The intestinal absorption of antigenic protein," and papers on certain biochemical problems of general

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**Hay-Fever and Asthma.** Ray M. Balyeat, A.M., M.D., Instructor in Medicine in the University of Oklahoma Medical School. 198 pages, 27 illustrations. Price $2.00 net. F. A. Davis Co., Philadelphia, 1926.

This work is intended for the guidance of those suffering from hay-fever and asthma. It is written simply and clearly, with unusual care and judgment in the selection of what to say to the laity. The smallest details are explained with great care, for example, the composition of kapok in reference to its value as a substitute for feathers. Illustrations are inserted to emphasize certain points, such as a photograph of a large family of cats sunning themselves on the verandah, to serve as a reminder of one of the sources of asthma, and in what quantity it may exist.

One cannot dwell too much on the attractive style of this book. It illustrates well how effective is the use of the simplest language. We feel sure that Dr. Balyeat will be a help to many sufferers with those maladies which even in their least severe form can so thoroughly dull the edge of existence.

H. E. MACDERMOT

**Practical Physiological Chemistry.** Philip B. Hawk, M.S., Ph.D., and Olaf Bergeim, M.S., Ph.D. Ninth edition. 931 pages, 273 figures, some coloured. Price $6.50. P. Blakiston's Son & Co., Philadelphia, 1926.

I have used Hawk's as a practical text-book of biochemistry for medical and science students for a number of years, and I must continue to use it since I think it is still the best available. But this edition exhibits definite defects as a text-book which is, according to its title-page, "designed for use in courses in practical physiological chemistry in schools of medicine and of science." The sixth edition (1918) numbered 661 pages, the seventh (1921) 675 pages, the eighth (1923) 693 pages, but the present edition has jumped to 929 pages with a corresponding increase in price.

I do not think that the medical student should be required to purchase such huge text-books in subjects such as biochemistry. He certainly will read but a small portion of them at all thoroughly. To what is the huge size attributable? At the present time, writers of theoretical text-books on the subject seem desirous of incorporating the necessary practical work, while writers of practical text-books attempt to incorporate as much theory as possible. In most medical schools of any size the arrangement of practical work (where classes require sub-division to meet timetable requirements and laboratory accommodation) cannot be absolutely correlated with theoretical teaching; theoretical text-books should contain much matter which cannot, or need not be illustrated by experiment. In my own experience separate text-books are highly desirable. That dealing with theory should give a simple and well-ordered outline of the subject dealt with in logical sequence, while the text-book of practical work should include details of experiments illustrating the most important facts of the subject, and a critically chosen selection of the best analytical procedures, with just enough theory to co-ordinate and explain the practical exercises.

If this view be the right one then the book under review contains far too much theory. Further, much space is taken up by detailing methods which only differ in minutiæ. We might reasonably expect an author of Dr. Hawk's long experience to assist us in presenting the best procedure of test or estimation (*i.e.*, the most accurate procedure in which students can be easily trained). One such, with journal references to others, is sufficient for both teacher and student. By elimination of theory which is out of place in a practical text, and of unnecessary variations of tests and analytical procedures, the book might have been kept within its former size, though even that was open to criticism.

New chapters have been included on the physical chemistry of true and colloidal solutions, on absorption, on the endocrine organs, and on energy metabolism; the greater part of this added text is theory. The chapters on blood chemistry, respiratory metabolism and neutrality regulation, and metabolism studies have been considerably enlarged.

Many of the experiments that have been included, such as, for example, those on the internal secretions, should never waste the valuable time of the medical student, who certainly requires a theoretical knowledge of their results, but should obtain it from lectures. Speaking generally, we teachers of special subjects have too frequently so great a regard for the value of our own subject that we tend to forget that it is but one of several in a science course, and but one of many in a medical course. I recently heard a lecture by a distinguished dental specialist, and it was quite obvious that he looked on the whole of the processes of life through a tooth and a carious tooth at that. It is time that we considered the student as well as our subject, and endeavoured to co-ordinate, and if necessary subordinate our subject to his whole course of study.

The book is well printed, illustrated, and bound. While it is nowadays too much to expect the use of the diphthangs æ and œ in American texts, yet it is pleasurable to miss those chemical spellings made uncouth by elision of the final *e* as is so common in American medical text-books. The volume appears singularly free from errors of fact.

While, therefore, this ninth edition of Hawk and Bergein cannot be too highly recommended as a reference book which should be in every laboratory in which any biochemical work is done, and while it is, in my opinion, still the best text-book for medical students, any new, critically written, and simpler text-book of modest size will probably materially diminish its circulation. I cannot in consequence altogether admire the complacency exhibited by the senior author in his preface.

A. T. CAMERON

**An Atlas of Midwifery.** Comyns Berkeley, M.A., M.C., M.D. Cantab., F.R.C.P. Lond., M.R.C.S. Eng., Senior Obstetric and Gynæcological Surgeon, the Middlesex Hospital, etc., and George M. Dupuy, M.D. 160 pages. Illustrated. The Macmillan Company of Canada, Ltd., Toronto, 1926.

In the preface the authors point out this is an atlas and not a text-book, and this is true. It forms an excellent companion of a good text-book. It is divided into five sections. *Section 1. Anatomy.*—Fig. No. 4 gives a good depiction of the axis of the pelvis. The floor of the pelvis from above and below is well illustrated in Figs. No. 9 and No. 10; while Fig. 11 show these muscles during distention. Figs. No. 17 and No. 18 are very good, one giving a view of the pelvic viscera from above and the other a medium sagittal section. The placental circulation is illustrated and explained in Fig. No. 43.

*Section 2. Pregnancy.*—The drawings here show both normal pregnancies and abortions. Fig. No. 62 is an illustration of Hegar's sign, but Fig. No. 63 illustrates an attempt to elicit this sign in a non-pregnant uterus. This very much adds to the value of the first. Tubal gestation with its different possibilities of rupture are shown in Figs. Nos. 79 to 84.

*Section 3. Labour.*—In Section 1, Figs. No. 30 and No. 42 show the measured diameters of the child's head, and these with Figs. No. 104 and No. 112 show the bearing these have in the different vertex presentations during labour. These are followed by a series which

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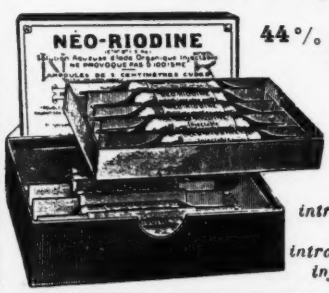


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show how the cervix is taken up during the first stage. Each step in the second stage is also shown. The methods of separation in the third stage are not shown, but manual expression is shown. Face, brow, shoulder and breech presentation, are all illustrated.

The author illustrates in Fig. No. 128 the landmarks for a lateral episiotomy, stating that it is rarely used, whereas here we use the median episiotomy with good results during delivery, and a perfectly healed wound in ten days. We believe that the perineum by means of it escapes the permanent damages resulting in cystocoele, rectocoele, etc., afterwards.

The breast bandages of Fig. Nos. 226, and 227 are not easily put on, and it would seem, give no better compression than the ordinary Murphy binder.

Fig. No. 222, depicting intravenous infusions may prove misleading, inasmuch as the needle is shown in the vein and the tourniquet not released; neither is the necessity of immediate removal of tourniquet, as soon as the fluid is released, mentioned in the accompanying note.

*Section 4. The Child.*—These drawings illustrate the handling of the new-born infant. Fig. No. 232 illustrates spinal friction to stimulate respiration, which is as effective and much safer than spanking. Sylvester's, Marshal Hall's, Schultz', and Byrd's methods of artificial respiration are shown as well as the mouth to mouth method.

*Section 5. Radiology.*—Several very good plates of four months, six months, eight months, and last month of pregnancy in triplets, twins and single pregnancies are shown.

GEO. M. WHITE

**Gynæcological Diagnosis and Pathology.** A. H. F. Barbour, M.D., LL.D., F.R.C.P. and B. P. Watson, M.D., F.R.C.S., F.A.C.S. Third edition, reprinted. 223 pages, 201 figures, 8 coloured plates. Price $3.00. W. Green & Son, Ltd., Edinburgh. Macmillan Co. of Canada, Toronto, 1926.

The third edition of this work in ten years time, bespeaks its popularity. It is written primarily for the medical student, and being a short concise outline showing the relationship of the pathology of gynæcological conditions to their clinical manifestations, it must prove quite an asset. This volume is not a new edition but a reprint of the third edition called for by Professor Watson's transfer to Columbia University.

"Pathology in relation to physical signs forms the basis of the book." The first thirty pages deal with methods of examination: abdominal, bimanual, recto-vaginal, curettage, etc. The pathology gross and microscopic of the different pelvic conditions, and the influence of the pathology on the signs and symptoms of the disease, is covered in the remaining 180 pages. Many cuts, most of them copies of actual microscopic and gross specimens, add much to the clarity of the book. Excessive detail is avoided. Differential diagnosis and methods of treatment are omitted entirely.

ELEANOR PERCIVAL

**The Significance of the Physical Constitution in Mental Disease.** F. I. Wertheimer and Florence E. Hesketh. 76 pages, 20 figures, and 5 plates. Price $2.50. Williams & Wilkins Co., Baltimore, 1926.

The "disintegration" of sick people, that, as the result of extreme and narrow minded specialization has been going on for the last decade, is slowly being replaced by the idea of "integration"—of viewing the patient as a whole instead of concentrating attention on this or that organ, where the processes of disease are most spectacularly displayed. The way in which a given individual responds to the more or less sudden maladjustment known as Disease depends on (1) his constitution; (2) the conditioning that this constitution has undergone as the result of "the multiform intra- and extra-uterine acquisitions, influences and adaptations of the organism." Hence the importance of a broad and complete study of the sick man battling with his disease.

The medical profession and indeed the laity have long recognized that human beings may be classified on the basis of physical "habitus." In fact the idea that "habitus" had something to do with liability or resistance to disease has never entirely disappeared from medical thought and writing. It seems now to be emerging from a rather prolonged sojourn "on the back benches." In the past two or three years not a few articles and books have appeared setting forth the relation between extreme bodily conformation and internal organization. Certain variations in the functional activity or various organs may be expected in certain types of habitus.

More recently attention has been drawn to the relationship between habitus and mental reaction types. The present small volume represents an American contribution to this subject. The authors record the results of their examination of mental patients from the standpoint of habitus. Their observations have been many and a long series of the most painstaking measurements have been made. This portion of the work constitutes a remarkably complete study in medical anthropometry but to many the details may prove somewhat burdensome. Such will find the sections on "Factors influencing morphological habitus" and "Correlation of psychoses and prepsychotic personalities with index values and body types from observation" full of interest. They contain the nucleus of the book and open up a new field that psychiatrists and internists especially should find worth cultivating. The authors have carefully reviewed previous literature, have apparently carried out their own investigations painstakingly and have stated their conclusions conservatively. They feel that individuals generally correspond morphologically with one or other of two types, the *pyknic* and the asthenic. They suggest Mr. Pickwick as a good example of the former and we might suggest as an example of the asthenic type "the lean and hungry Cassius"—seclusive—the type of man whom Shakespeare says "is dangerous—he thinks too much." Among mental patients the *pyknic* type is noted predominantly among those exhibiting manic depressive reactions, while the asthenic most frequently exhibit schizophrenic reactions.

The authors do not claim to have settled anything and they feel that to base diagnostic or prognostic criteria on their findings would be premature. They simply have made a preliminary sketch to which they or someone else may add eminently practical details as time goes on.

A. T. MATHERS

**A Shorter Surgery.** R. J. McNeill Love, M.B., M.S., F.R.C.S. 298 pages, 43 illustrations. Price 12/6 net. H. K. Lewis & Co., Ltd. London, W.C.1, 1926.

This volume on surgery was written as an attempt to present the more important principles of surgery to the student. The author has accomplished a difficult task most creditably. The arrangement of the subject matter is excellent and makes enjoyable reading. Unimportant details, usually confusing to the student, are omitted, and facts and essentials clearly and concisely presented.

In a book of this type one does not expect operative procedures stated in detail, because the object of the volume is to teach surgical principles, symptoms, and diagnosis. This the author has successfully accomplished.

R. V. B. SHIER

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## THE REBUILDING OF "BARTS" IN THE EIGHTEENTH CENTURY

Sir D'Arcy Power has contributed to *St. Bartholomew's Hospital Reports* a paper, "The rebuilding of the hospital in the eighteenth century," from which it appears that even the two large volumes of Sir Norman Moore's history do not tell the whole story. In 1723 a general court decided on rebuilding some part of the house, and appointed a committee, among whose members were Drs. Mead and Freind and the architects Nicholas Hawksmoor and James Gibbs, with instructions to prepare a plan. Both these architects have left their marks on the church buildings of London. Both of them were steeped in the Wren traditions, and especially Hawksmoor, who was the scholar and domestic clerk of Sir Christopher. The two took a large part in designing and building the fifty new London churches at the close of Queen Anne's reign, but Gibbs's greatest claim on the interest of the medical profession, especially of its London consultants, rests on his building of St. Peter's, Vere Street, a church which has a peculiar connection with the medical quarter and in which the funeral services of many of the great ones of medicine and surgery have been held. These two artists freely gave their services to St. Bartholomew's, and Gibbs in particular gave his designs and supervision to the work of rebuilding. Neither of them could produce anything to rival Wren's best work, such as the steeple of St. Mary-le-Bow, and in the heyday of the Gothic revival their work was despised as dull and heavy; but in these days, when even the baroque style has its enthusiastic admirers, we are once more allowed to find beauty in the work of the followers of Wren. But a more interesting person than either of the architects was soon added to the court in the person of Ralph Allen of Bath, the Squire Allworthy of *Tom Jones* and the host and benefactor of Fielding and of Pope and of many others. The former has immortalized his friend in "that exquisite picture of human manners," and the latter, in his *Satires of Horace,* wrote:

> "Let Humble Allen, with an awkward shame
> Do good by stealth and blush to find fame."

Allen, after making a princely income by reforming the postal services, became still wealthier as the proprietor of quarries near Bath. In the *Dictionary of National Biography* it is stated that "he cased the exterior of St. Bartholomew's Hospital in London with stone at his own expense." Sir D'Arcy Power shows that this statement is inaccurate. Allen was an open-handed philanthropist, but he was enabled to become so by his keen business instincts and methods. He frankly told the authorities of St. Bartholomew's that his offer to supply the stone at a low price was inspired by a desire to get his stone known and to form a market for it in London. As things turned out he must have lost a great deal of money by his contract. The stone was conveyed from the quarry to barges on the river Avon, and then by water to Bristol, where it was put on shipboard for the sea voyage to London. All went well with the building of the first and second piles of the new structure, but soon after the third was begun the war of the Austrian succession broke out, and the risks to shipping were very grave. Even when Allen bought a quarter of a ship the press-gang and the temptations of service in privateers made it difficult to man her, and enemy action rendered the voyage dangerous. Finally, the ship was cast away, to Allen's loss. These and other causes delayed the work, so that the rebuilding was not finished till 1752, when the inscription over the inner gateway of the hospital was set up, but a later addition to this inscription stated that it was finished in the year 1770. Last year the members of the British Medical Association who attended the annual meeting at Bath had opportunities of seeing some of the results of Allen's philanthropy in the building of the Royal Mineral Water Hospital, as well as the magnificent home which he built for himself at Prior Park. Another great man and governor was William Hogarth, who was born in Bartholomew Close, and whose paintings on the walls of the great staircase are familiar to all visitors to the hospital. He grasped at the opportunity of showing his powers in the great style of history painting, and, as he said, "with a smile at my own temerity, commenced history painting," with "two Scripture stories, the 'Pool of Bethesda' and the 'Good Samaritan,' with figures seven feet high." But the public knew better than he did in what style of painting he most excelled, and, as he said, he "returned to the pursuit of my former dealings with the public at large." We are glad to note that this paper is only an instalment, and we look forward to the continuation which Sir D'Arcy Power promises to us.—*Brit. Med. Jour.*, July 17, 1926.